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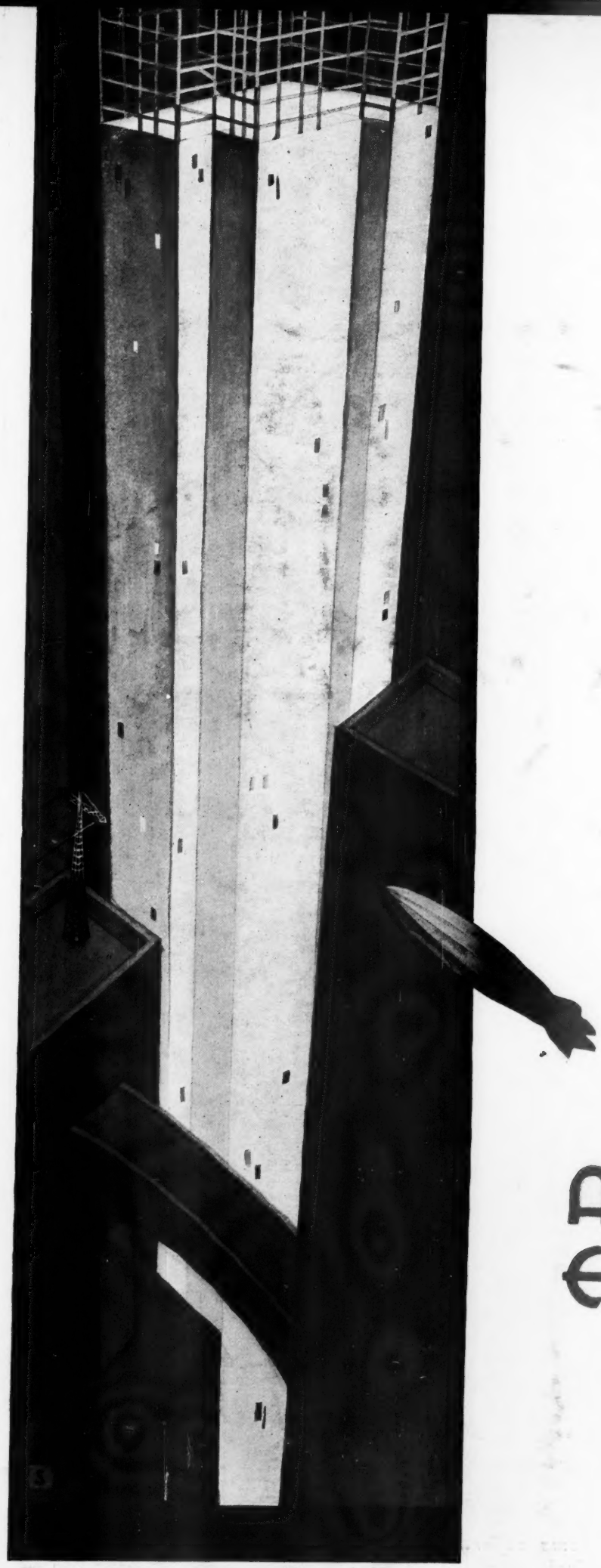

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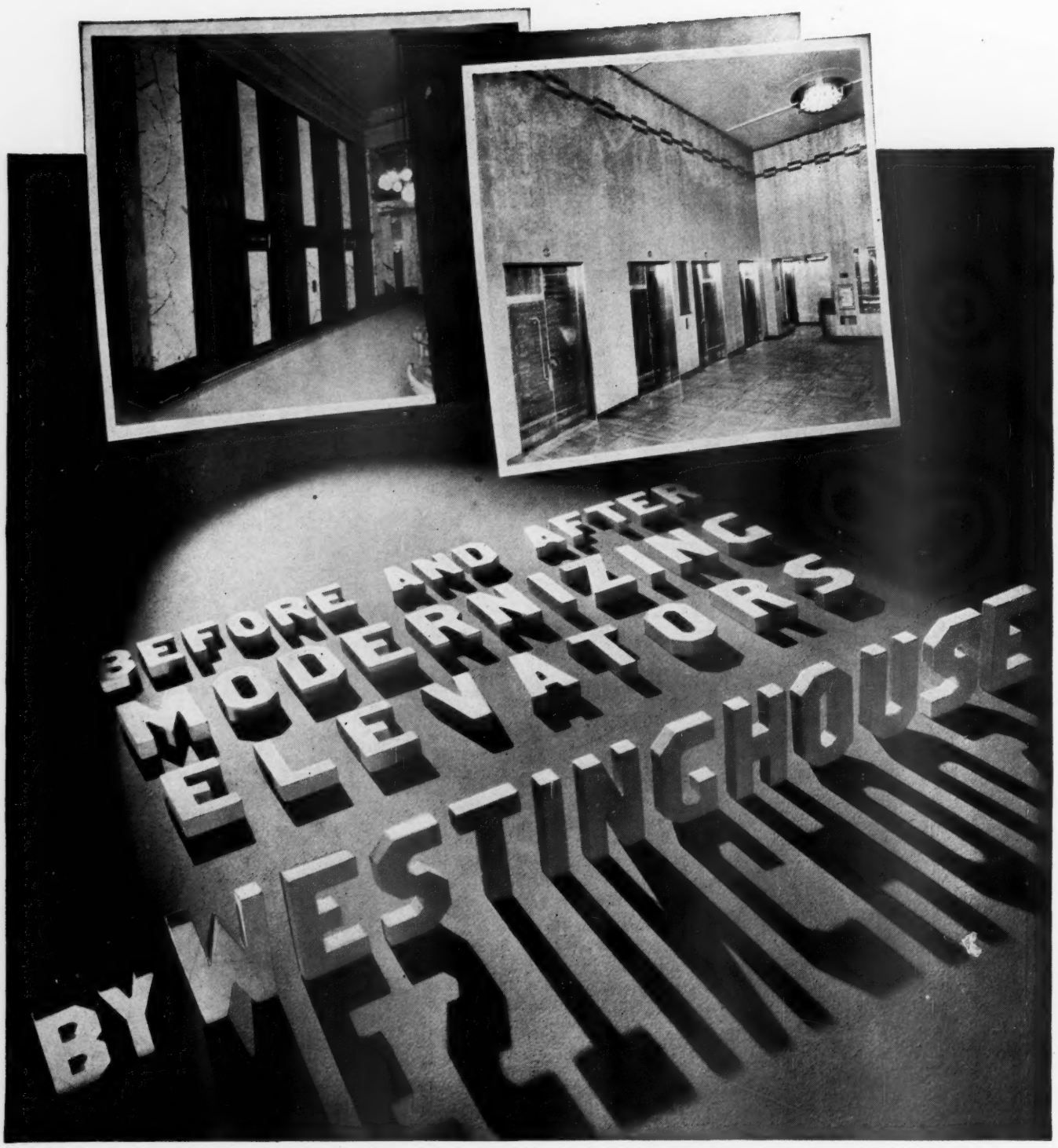

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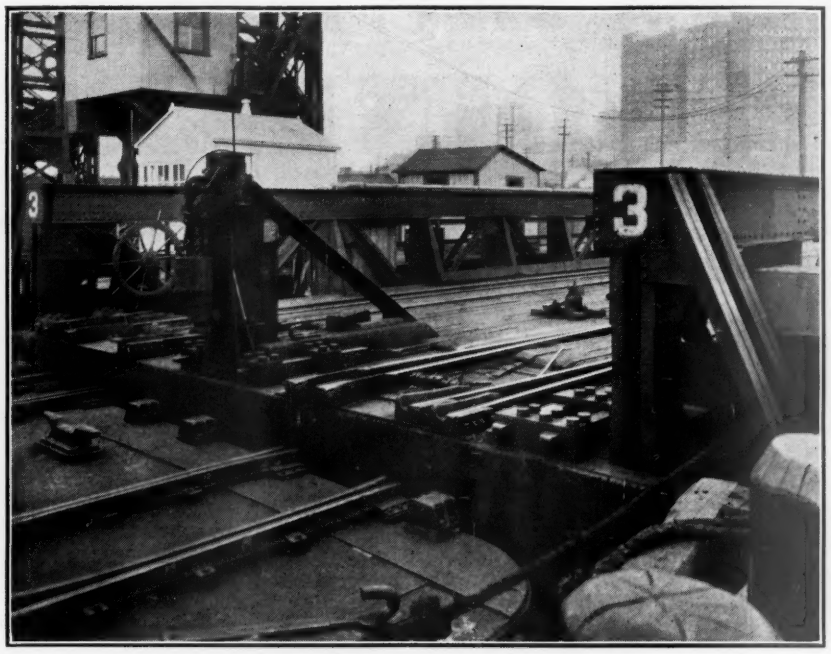

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ENGINEERS AND CODES

Should the Profession Be Industrialized?

Trade Recovery Program Presents Problems

ON July 7th last, Dr. D. B. Steinman, Chairman of the Professional Engineers United Front Committee for the Metropolitan Area addressed the following communication to the members thereof:

"Gentlemen:

In reference to the program of the United Front Committee of Engineers, comprising the representatives named above, the suggestion has come from several sources that an immediate activity should be the sponsoring of a "Code of Fair Competition" for approval by the President of the United States under the National Industrial Recovery Act. I have therefore asked John Blank, of this Committee, to prepare a preliminary draft of such code, and I submit herewith for your consideration a copy of the preliminary draft he has prepared. A study of this draft will show the possibilities in the direction of availing ourselves of the provision of the Industrial Recovery Act to protect the standards of employment and compensation of Engineers and to secure legal sanction for the enforcement of the essential features of the Code of Ethics of our Profession.

I therefore request each of you to study the enclosed draft in connection with the provisions of Title I of the National Industrial Recovery Act and to advise me:

1. Whether, in your opinion, it is *feasible* to enroll the Engineering Profession (or at least that part of it associated in any manner with the Construction Industry) under the provisions of Title I of the National Industrial Recovery Act.

2. Whether, in your opinion, it is *desirable* to so enroll the Engineering Profession.

3. What suggestions you have to amplify or improve the preliminary draft of the Code herewith submitted.

4. Whether you would be willing to serve on a sub-committee to work on the preparation of a final draft of such Code and to arrange for its submission to the National Industrial Recovery Administrator.

Your prompt response will be appreciated.

Faithfully yours,
(sgd) D. B. Steinman,
Chairman, United Front
Committee."

Replies have been received from practically every member of the Committee. These responses indicate that the consensus of opinion is against coding the engineering profession. The prevailing belief appears to be that codification, especially under present conditions, might set up compensations so low as to strangle the profession and reduce it to the level of a sweat-shop industry. On the other hand, there has been expressed the fear that unless the Engineer is coded voluntarily and plays a part in the coding, he may find himself included in the so-called white collar group at a minimum weekly salary of about $14.00 a week.

At the present writing it is a matter of opinion as to whether the Engineer is included within the scope of the provisions of the National Recovery Act in so far as the same applies to coding. The lawyer and doctor apparently are exempt from regulatory control. The architects seemingly do not wish to be included for fear of losing a professional status. The accountants, from press reports, are divided. One group in New York prepared a Code with a minimum of $100 a week salary for assistants and $200 minimum for principals. The Certified Public Accountants Association is opposed to any codification, basing their arguments upon the same grounds as the architects.

Generally, the professional groups appear anxious to avoid being regulated. The hours of employment of a professional man cannot properly be limited and should not be set forth in the same manner as those for most other callings. The protection of life, health and property must recognize and allow for emergencies.

There are, of course, considerations that merit

(*Continued on Page 16*)

STRAIGHT THINKING

How the Engineer Can Improve Democratic Government

By C. F. Hirshfeld

Reprinted Through the Courtesy of the Massachusetts Institute of Technology Review

DURING the time that America's comparatively young democracy has been in existence a very sweeping change has occurred in human affairs. Practically all of what we call modern science has been developed, and, out of it has come an industrial culture which has been grafted upon an earlier and more natural civilization based fundamentally upon agriculture. Asked how this thing has come about the average person would undoubtedly attribute it to scientific discovery and to invention. The writer believes it is possible to be more fundamental in answering such a question. To him it has come about through the intensive application of a new method of thought, which has been defined grossly as the scientific method.

This method is characterized by requiring proof of each mental step that is taken. Past teachings, traditions, precedents, convictions are not sacred; they are accepted only so long as they stand the test of the most rigorous experimental proof that can be devised. Just so soon as any one of them fails to meet such test it is unceremoniously dumped overboard to make room for its successor. The process is rigorous and unsentimental, but it does produce results. It represents the straightest sort of thinking that mankind has yet indulged in for the simple reason that it does not trust intelligence beyond the last experimentally proven step in the process of thought.

The scientist has used this method with wonderful success in uncovering the workings of the universe. He expends his energies in uncovering truth for truth's sake. In general he has no particular interest in or concern for useful applications which may be made as a result of his discoveries. To him the discovery is the all-sufficient aim and end. In one sense he is the great idealist of our present culture.

Other more materialistically minded individuals, however, have taken his products and by using his methods have succeeeded in greatly changing the conditions of our lives. An outstanding group, among these more practically minded individuals, is that of the engineers. These men appropriate the results of the work of the scientists and apply them to the satisfaction of human desires of one sort or another. Their problem is more complicated than that of the scientist because of the many limitations under which they work. These are partly economic in character, but limitations are also set by the characteristics of available materials and by such apparently extraneous things as individual and mass psychology.

Like the scientist, the engineer must start from proven facts and must think very clearly toward the next provable step. Unlike the scientist, he cannot always obtain all the necessary facts with which to start and he is also frequently confronted with the necessity of construction before proving the correctness of all the underlying steps of his reasoning process. Further, he generally departs rather early in his problem from the simple consideration of the inexorable laws of Nature and wanders through various fields of approximation and compromise. His problem is indeed a difficult one. And yet we have engineers in abundance who do succeed in picking their ways safely through poorly charted or even uncharted fields. We do have engineers who succeed in building upon the clean-cut and clearly stated laws of science the practical structures which make proper allowances for the idiosyncrasies of commercial materials, pertinent economic limitations, and the ever changing viewpoints and tastes of humanity.

Fundamentally his method requires that conclusions be based primarily upon proven fact and secondarily upon logical and, if possible, proven deductions therefrom. It is distinctly impersonal. It is directly opposed to emotional, traditional, partisan, and selfish methods. For want of a better comprehensive description it is called straight thinking, for that is, in the ultimate, exactly and completely what it is.

It has always seemed strange that the engineers should be the only large group that has extensively adapted the methods of the scientist to the purposes of its own business. And, it has also always seemed strange to me that this group should, in general, have been satisfied to confine such rigorous and practically profitable thinking to problems of what we commonly call an engineering nature. One is particularly impressed by the way in which most engineers slough off their carefully developed training and join the unthinking, whimsical mob when it comes to a consideration of political questions.

It is reasonable to believe that if engineers could be made to apply their methods in the personal consideration of many of the problems of a non-engineering character with which we people of the world wrestle more or less impotently and if in addition they could be made articulate in such matters, they could and would supply the leaven of straight thinking that is so badly needed in modern life. The writer believes that along such a route lie the means of so altering the conduct of democratic government as to save it from self-destruction and to make it attain at least to some of the heights that its idealistic advocates believe it capable. Barring an infusion of straight thinking from this or some other similar source, one fears that our democracy and the other democracies of the world must ultimately give place to forms of government in which the great majority, instead of directing, is directed.

(*Continued on Page 16*)

LEGAL TESTS OF REGISTRATION

Decisions In Various States

Report of National Council of State Boards

AN interesting compilation of court decisions wherein the validity and scope of licensing laws have been the subject of legal action has been prepared by a Committee of the National Council of State Boards of Engineering Examiners. It is printed herewith for the information of the profession.

At the Thirteenth Annual Convention in New York City, during September and October, 1932, it was suggested by Dr. D. B. Steinman, then President of this Council, that it would be very helpful to all State Boards to have a National Committee collect and record Court decisions in the various States where Engineering Registration laws have been subjected to a judicial interpretation. Accordingly, a Committee was appointed and its report is herewith submitted.

A questionnaire was addressed to twenty-five State Boards on this subject and twenty-four replies were received. Nineteen States have either amended their original laws in order to clarify, simplify and strengthen or enacted new laws entirely and six States reported no changes. The laws in the States of Indiana, Oregon, Pennsylvania, Tennessee and Wyoming have been construed by the Courts of those States and opinions have been furnished your Committee by the Board of Indiana, Pennsylvania and Tennessee. These opinions are lengthy except that of the State of Indiana and we are attempting in this report to be brief and to cover the points questioned and not burden you by quoting lengthy opinions in full.

INDIANA

In the State of Indiana an indictment was returned against Ralph Cochran by the Grand Jury in October, 1931. The indictment set out that the said Ralph Cochran, after accepting the appointment of Engineer and Drainage Commissioner by the Board of Commissioners in Shelby County, Indiana, unlawfully made surveys for deepening, widening and tiling of certain drainage ditches in that county. That he unlawfully practiced and offered to practice professional engineering without qualifying as a professional engineer or land surveyor, provided in the Indiana Registration Law. That he had been a resident of the State of Indiana continuously for more than two years last past, and had an established place of business in said State. That he was not an employee of a registered professional engineer, nor an officer of the United States, nor was he an employee or officer of the State of Indiana, or any political sub-division thereof. That he was not exempt from the provisions of the engineering registration law and, therefore, practicing in violation of said Statutes, when signing a report as Engineer which he filed with the Auditor of Shelby County, Indiana, in July, 1930. The case came on for hearing in Circuit Court, October, 1931, and after the evidence was concluded the Court sustained a motion of the defendant to instruct the jury to return a verdict of not guilty. The Court held:

> "The Statutes pertaining to the licensing and practicing of professional engineers does not contain any section defining what a professional engineer is or what acts shall constitute the acts of practicing professional engineering and without a definition by which the jury could be guided in determining who was a professional engineer or what constituted the acts of practicing professional engineering they would be unable to bring any conviction."

And further, the Engineering Registration Act at that time provided, "that the County Board of Commissioners shall appoint a County Surveyor to act, if competent, in the planning and construction of land drainage, etc.," and that the defendant was so appointed and acted under his appointment as required by said Act and that in so performing his duties no criminal act had been committed.

The outstanding point in this decision is that no definition was incorporated in the law specifically defining a Professional Engineer, Professional Engineering or a Land Surveyor. The case was not appealed to a superior court. We understand the State Board of this State has or will amend its law and provide adequate definitions.

PENNSYLVANIA

The legality and constitutionality of Act 422 of Acts of 1921 of the Commonwealth of Pennsylvania (the original act) regulating "The practice of Professional Engineering and Land Surveying Act" was questioned in the case:

Commonwealth of Pennsylvania ex rel, George W. Woodruff, General Attorney, vs. Richard L. Humphrey, A. B. Clemens and Henry I. Drinker, Members of the State Board of the Registration of Professional Engineers and Land Surveyors.

This case was brought before the Supreme Court of Pennsylvania on a writ of Quo Warranto, the simple definition of which is a demand made by the State upon some individual, to show by what right he exercises some franchise appertaining to the State which, according to the constitution and laws of the land, he cannot legally exercise except by virtue of some grant of authority from the State. The Act was held unconstitutional and the reasons therefor are here briefly discussed.

The Act under question enumerates under a general group all persons who must register under the act to lawfully pursue the profession of engineering or suffer a penalty for their failure to do so. It then sets out several groups who may practice

(*Continued on Page 19*)

The Engineers' Council For Professional Development

Organization of Committee Effected During 1932

D. B. Steinman

At the recent convention of the National Council of State Boards of Engineering Examiners held during the week of June 25th in Chicago, the following account of the activities of the Engineers' Council for Professional Development was submitted in a report by D. B. Steinman.

The aims of the Council are constructively ambitious and its accomplishments will be watched with interest by Engineers throughout the country.

Engineers' Council for Professional Development

Report to the N. C. S. B. E. E.

The organization meeting of the Engineers' Council for Professional Development was held October 3, 1932, in the Board Room of the Am. Soc. C. E., with 21 representatives present. The National Council of State Boards of Engineering Examiners was represented by Parker H. Daggett, T. Keith Legaré, D. B. Steinman, and Hugh A. Kelly. The plan for the E. C. P. D., as drafted by the Conference on Certification which preceded it, had been approved by six of the participating bodies, namely the A. S. C. E., A. S. M. E., A. I. E. E., A. I. Ch. E., S. P. E. E., and N. C. S. B. E. E. (The A. I. M. E. ratified the plan on Oct. 21, 1932, completing the total of seven participating bodies.)

At the organization meeting, C. F. Hirshfeld (A. S. M. E.) was elected Chairman, Pro Tem., and C. E. Davies (Executive Secretary of the A. S. M. E.) was elected Secretary, Pro Tem.

An outline of a suggested program for the Committee on Student Selection and Guidance was presented by C. E. Davies. In the discussion following, it was pointed out that this Committee should guard against the danger of attracting enrollment to engineering schools by its activities.

A preliminary outline of procedure for the Committee on Engineering Schools, submitted by H. P. Hammond, H. C. Parmalee, C. P. Bliss, and P. H. Daggett, recommended that the essential activity for that committee should be to prepare, submit, re-study, and finally recommend criteria for accrediting engineering schools. It was voted to accept this preliminary report and to authorize the immediate appointment of the Committee on Engineering Schools. The report of the N. C. S. B. E. E. on Accrediting Engineering Schools was referred to that committee.

A program for the Committee on Professional Training was presented by General Robert I. Rees. The range of this Committee is to extend from graduation of the young engineer to the time he attains full professional status. The proposed program includes emphasis of the need of post-college training, the organization of local discussion groups, the provision of guidance and advice to young engineers, and enlisting the cooperation of business and industry.

The program presented for the Committee on Professional Recognition stated: "There are now many grades of professional recognition in the various engineering degrees, memberships in engineering societies, and registration and licensing procedures. The task of this committee will consist of the analysis of existing methods and the recommendation of a procedure for progressive professional recognition looking toward an improvement in the present situation."

Chairman Hirshfeld was authorized to appoint an Interim Executive Committee to organize the committees of the E. C. P. D., and to develop rules and procedure. He appointed J. Vipond Davies (A. S. C. E.), William E. Wickenden (A. S. M. E.), C. F. Scott (A. I. E. E.), H. C. Parmelee (A. I. Ch. E.), Donald F. Irvin (A. I. M. E.), R. I. Rees (S. P. E. E.), D. B. Steinman (N. C. S. B. E. E.), with C. F. Hirshfeld and C. E. Davies, ex-officio. All communications from organizations and individuals were referred to this Executive Committee.

An organization meeting of the Executive Committee was held on the same date, Oct. 3, 1932, at the Engineers Club in New York. Seven of the nine members were present. Chairmen of the four principal committees were tentatively selected, and Secretary Davies was requested to draft suitable rules of procedure.

The second meeting of the Executive Committee was held at the Engineers Club on November 30, 1932. Eight of the nine members were present, also Harrison P. Eddy, Karl T. Compton, and George T. Seabury (Secretary A. S. C. E.). The N. C. S. B. E. E. was represented by D. B. Steinman. The "Charter and Rules of Procedure," drafted by Secretary Davies, was approved as amended and ordered referred to all members of the E. C. P. D. for approval by letter ballot. This Charter consists essentially of the statement of objectives that had been approved by all of the participating bodies in authorizing the organization of the E. C. P. D. It was voted to approve the following appointments as Chairmen of the four principal committees:

Committee on Student Selection and Guidance, Harrison P. Eddy (subsequently resigned); Committee on Engineering Schools, Karl T. Compton; Committee on Professional Training, Robert I. Rees; Committee on Professional Recognition, Conrad N. Lauer.

It was voted to approve the release of publicity,

(*Continued on Page 21*)

REGISTRATION INFORMATION

National Bureau Aids Applicants

Provides Machinery to Facilitate Action

THE number of inquiries which have come to The American Engineer, relevant to the question of Registration in the several states, suggests publishing the bulletin of the National Bureau of Engineering Registration.

Since the issuance of the said bulletin in 1932 but one change has been made. This change pertains to the question of fees and has been incorporated in the bulletin as herewith printed.

BULLETIN

The National Bureau of Engineering Registration is operated under the auspices of the National Council of State Board of Engineering Examiners, assisted by an Advisory Board of representatives from national engineering societies. It has been established primarily for the convenience of engineers, especially those practicing in more than one State, to minimize the effort and expense of securing registration. The Bureau also constitutes a clearing house for the convenience of the registration authorities of the various States having laws regulating the practice of professional engineering and acts as a reliable source of verified information regarding the professional records of engineers.

The purpose of the National Bureau of Engineering Registration is to investigate and verify the records of professional engineers and issue to those who fully comply with the regulations and requirements adopted by the Bureau a "Certificate of Qualification," which may be used as evidence of qualification—for registration as a professional engineer with State Boards of Registration, for membership in national and state engineering societies, in connection with award of professional degrees by engineering colleges, for presentation to clients when soliciting contracts for professional services, for presentation to employers when applying for positions, etc.

The Certificates of Qualification issued by the Bureau are in no sense obligatory for the applicant nor binding upon the State Boards of Registration, nor does the Bureau assume any responsibility to the applicant for securing his registration authorizing the practice of engineering in any State. However, State Boards of Registration are expected to give due consideration to the Bureau's certificates in passing upon the qualifications of an applicant for registration.

An independent investigation such as is conducted by the Bureau often requires considerable time, therefore, it is suggested that an engineer not wait until he actually needs a Certificate of Qualification but that he file his application with the Bureau whenever convenient, so that a certified copy of his professional record may be available at any time for presentation to State Boards of Registration with which he desires registration, or for any other purpose.

Information secured from references is for the confidential use of the Bureau in verifying and passing upon professional records of applicants, the source and character of this information not to be divulged except in special cases when desired by legally authorized State Boards of Registration.

REQUIREMENTS FOR CERTIFICATE OF QUALIFICATION

A Certificate of Qualification will be issued only to an applicant who fully complies with the following minimum requirements for a Professional Engineer and who conforms with the other regulations of the Bureau:

A. Graduation from an approved course in engineering of four years or more in a school or college approved by the Bureau as of satisfactory standing; and a specific record of an additional four years or more of active practice in engineering work of a character satisfactory to the Bureau and indicating that the applicant is competent to be placed in responsible charge of important engineering work; or

B. Successfully passing a written, or written and oral, examination designed to show knowledge and skill approximating that attained through graduation from an approved four-year engineering course; and a specific record of eight years or more of active practice in engineering work of a character satisfactory to the Bureau and indicating that the applicant is competent to be placed in responsible charge of important engineering work; or

C. A specific record of twelve years or more of active practice in engineering work of a character satisfactory to the Bureau and indicating that the applicant is qualified to design or to supervise construction of engineering works and has had responsible charge of important engineering work for at least five years and provided applicant is not less than thirty-five years of age.

DEFINITIONS

In passing upon the professional record and experience of an applicant the Bureau shall construe "professional engineer" or "active practice in engineering work" as follows:

The term "Professional Engineer" shall mean a person who, by reason of his knowledge of mathematics, the physical sciences and the principles of engineering, acquired by professional education and practical experience, is qualified to engage in engineering practice as hereinafter defined.

The practice of professional engineering includes any professional service, such as consultation, investigation, evaluation, planning, design, or responsible supervision of construction or operation,

(*Continued on Page 22*)

Revise Economics, Mobilize Incomes, Expedite Recovery

Radio Address Over National and Columbia Systems

By Arthur V. Sheridan

THE civilization of the moment is a highly integrated one of mechanical complexity. The creator of that civilization is primarily the Engineer, but he has not been the director or administrator thereof. The causes are his but not the effects. He has given to mankind the opportunity for culture and for urban existence, but can hardly be held accountable for the failure of a society, which has ignored him as an administrator, to properly utilize his creations.

The principles and doctrines of financiers, economists and industrialists of the various schools of the 19th century, which doctrines, during that period, were so frequently miscalled science, have proven inadequate for the civilization resulting from scientific and engineering discovery and invention. Steeped in the sophistry and fallacies that have arisen from theories developed upon untenable assumptions, these so-called experts, because of ephemeral success, eventually became contemptuous of first principles and axiomatic truths. Economic philosophy must be revised with the thought in mind that the great problem of humanity is to reconcile a changing civilization with an unchanging human nature.

Political economy which refuses to recognize that "The Man Who Owns Things" is of far less importance to civilization than "The Man Who Can Do Things," is predicated upon unsound premises and cannot endure. There is little doubt that less than a generation will elapse before the world as a whole will have cast into discard a system that makes possible starvation in the midst of a superabundance. Today a land overflowing with the "milk and honey" required to alleviate human suffering lies round about millions of American citizens, while they, like the untouchables of India, must keep their distance.

It required the exigencies of a threatening situation and the forcefulness of a great leader, in the person of President Roosevelt, to make fashionable the doctrine that financial rights must be subordinate to human rights, and that the wealth of a nation cannot be transmuted into gold for the sake of maintaining an unsound economic system and continuing the speculations that result in control of the medium of exchange.

One does not need to be a profound philosopher to realize that the creation of wealth, which latter is, after all, but a store or accumulation of those things which men desire to possess, cannot be indefinitely equated with a single element such as gold mined from the bowels of the earth. Suppose for a moment that the supply of gold ceased entirely,—would the value of the said gold become prohibitive, or would wealth remain stationary, whilst humanity increased and science and machinery multiplied the potential productive powers of mankind? Would this nation, possessed of a superabundance of food, clothing and shelter, starve to death or succumb to the elements if all the gold in the mints and banks of the United States were to be dissipated by explosion or other unforseen catastrophe? Useful as a medium of international exchange it is in no sense a true criterion of national resources. So far as the country itself is concerned, in the conduct of internal business, credits to the extent of the nation's governmental stability and control of its wealth, are the basic restrictions to the determination and expansion of currency or other exchange medium.

The wealth of a nation results from the bounty of nature and the labor of man. When man ceases to labor wealth ceases to grow and the spread of unemployment, not the decline of Wall Street speculation, is the real index of the nation's loss of wealth.

One of the greatest impediments to recovery is an inheritance of the passing economic order. The nation has been seized by an obsession for the paper balancing of budgets. The modus operandi consists primarily in reducing incomes and creating unemployment. Budget balancing for a governmental agency that derives its income from taxes is a fictitious and unwarranted policy. The wealth of governments is not capable of monetary liquidation, even to a fraction thereof. Credits must be used to balance, and honest credits cannot be increased by decreasing the causes of wealth. The curtailment of work that develops the resources of a nation not only increases unemployment and makes necessary unproductive charity, but actually decreases the sources of governmental income.

Aside from the question of unemployment and wealth there exists today, as a result of budget balancing, a danger to society. Much publicity is being given to the proponents of educational and other social endeavors who predict dire results if such endeavors are curtailed. The engineering profession wishes to bring to the attention of the people of this nation the suggestion that the cessation of activities, the planning, construction and maintenance of which are inseparable from modern existence, is conducive to disease and famine and will result in conditions far more dangerous to Society than inadequate education, administration or social relief.

Fortunately for the nation the New Deal is taking cognizance of the need for restoring employment as the direct means toward nationwide prosperity.

(*Continued on Page 22*)

CHAPTER MAPS

showing growth of

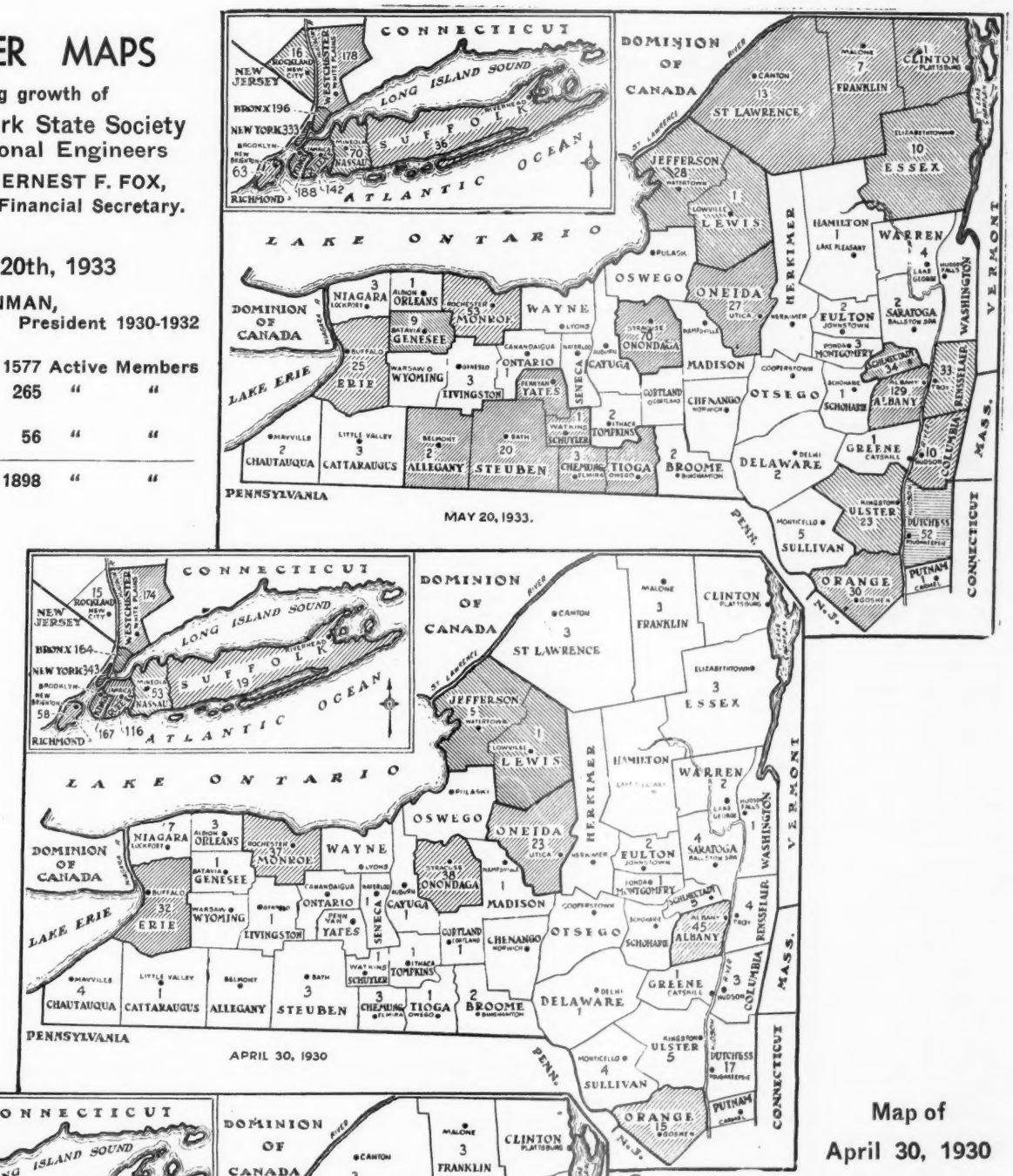
The New York State Society of Professional Engineers

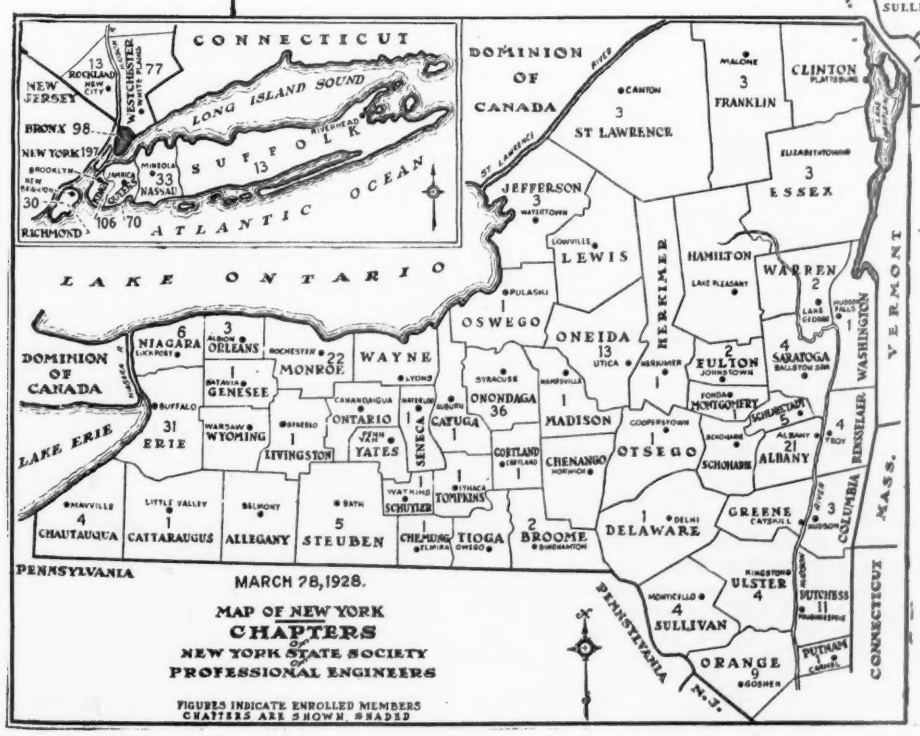
Compiled by ERNEST F. FOX,
Financial Secretary.

Map of May 20th, 1933

DAVID B. STEINMAN,
President 1930-1932

In 25 Chapters	1577	Active	Members
In 40 Counties	265	"	"
In 17 States outside of N. Y.	56	"	"
Total	1898	"	"





Map of April 30, 1930

ARTHUR V. SHERIDAN,
President 1928-1929

In 15 Chapters	847	Active	Members
In 45 Counties	549	"	"
In 14 States outside of N. Y.	85	"	"
Total	1481	"	"

Map of March 28, 1928

JAMES M. WELSCH,
President, 1926-1927

In 1 Chapter —Bronx County	93	Active	Members
In 50 Counties	764	"	"
In 14 States outside of N. Y.	75	"	"
Total	932	"	"

General News And Comments

Informative Items

ENGINEERS CODE DRAFTED

American Society of Civil Engineers Leads

On Wednesday and Thursday, August 1st and 2nd, respectively, representatives of various national and local engineering groups met at the Engineering Societies Building, in New York, to pass upon the preliminary draft of a Code for Engineers, which had been prepared under the direction of Carlton S. Proctor of the American Society of Civil Engineers.

The question of the propriety of coding the Engineer was, after a detailed account of, what has to-date transpired, of the possible advantages as against the dangers of remaining aloof, and, of the whole hearted determination of the architectural profession to identify itself with the construction industry, agreed upon as desirable by those present.

The Code, as drawn, applies only to the Engineer in so far as he is identified with the construction industry. The National Recovery Administration, having accepted the services of the Construction League of the United States, authorized that body to proceed with the preparations of a Code of fair competition for the construction industry as a whole and to co-ordinate the codes to be presented by the several divisions of the said industry.

Invitations were extended to nation-wide trade and professional organizations to become members of an Advisory Council, and the necessity and desirability for the participation of Architects and Engineers were recognized as all important.

In the preparation of the Codes Engineers' and Architects' representatives collaborated to an appreciable degree.

The Code as drafted offers the following definitions and terms:

In the meaning and application of this Code a professional Engineer shall be considered to be and include an individual, partnership or engineering corporation legally operating in responsible charge of the design and or control of construction work, or a person in the employ of the same and who is licensed in accordance with the provisions of law to practice engineering, or any subdivision thereof, within any State or Territory of the United States; or any such person admitted to, or eligible for admission to, Corporate Membership in the Am. Soc. C. E., A. S. M. E., A. I. E. E., A. I. Che. E., A. I. M. E. or A. A. E.

A client shall be an individual, firm, corporation or governmental agency, who engages on a fee basis the services of a professional Engineer.

An employer shall be any individual, firm, corporation, or

(Continued on Page 23)

N. I. R. A. INFORMATION

In Loose Leaf Form

A non-engineering publication of much interest to every active member of the profession, as well to every industry, is the Federal Trade and Industry Service. There is scarcely any industrial endeavor of magnitude that does not depend largely upon engineering services for its very existence and development. The coding of the various industries should be the concern of Engineers, even more than it is that of lawyers and economists. Perhaps engineering itself will have to be coded simply because of its interrelationships with industry. The Engineer must play an active role in the Recovery Program, in fact the principal role, and he should advise himself of the provisions and workings of what will unquestionably prove to be one of the most important regulatory acts ever promulgated by this nation; one that may revolutionize the social and economic orders of the world. The Engineer is urged to identify himself in every possible way in order that the civilization which he, through his creations, has brought about may be utilized to the best advantage of mankind.

The Federal Trade and Industry Service offers complete information upon the National Recovery Act and upon the process of coding the various industries. While the price of the publication is beyond most Engineers individually its value as a collective and organization service is worth consideration. The Service is furnished by Prentice-Hall, Inc., 70—5th Avenue, New York, N. Y.

* * *

N. I. R. A. PUBLIC WORKS

Regional Areas and Advisors Announced

With the appointment of Regional Advisors the Public Works Program may be expected to get under way during the month of August.

For the purpose of expediting activity and easing the task of the authorities at Washington the nation has been divided into ten regions.

The areas, headquarters and advisors are as follows:—

Region 1—Maine, Vermont, New Hampshire, Massachusetts, Rhode Island and Connecticut; headquarters, Boston; advisor, Ralph L. Cooper of Belfast, Me.

Region 2—New York, Pennsylvania, and New Jersey; headquarters, New York City; advisor, Edward J. Flynn, present Secretary of State of New York.

Region 3—Illinois, Indiana, Michigan, Ohio and Wisconsin; headquarters, Chicago; advisor, Daniel J. Tobin of Indianapolis.

Region 4—North Dakota, South Dakota; Nebraska, Minnesota, Iowa and Wyoming; headquarters, Omaha; advisor, Frank Murphy, Wheaton, Minn.

(Continued on Page 23)

TREASURY DEPARTMENT CALLS ON PRIVATE ARCHITECTS AND ENGINEERS TO PARTICIPATE IN NEW BUILDING PROGRAM

Release By American Engineering Council

Private architects and engineers throughout the country will be engaged by the Treasury Department to prepare the plans and specifications for a large Federal building program which may reach a total of $200,000,000. L. W. Robert, Jr., Assistant Secretary of the Treasury, has adopted this policy in order that professional men who have not had employment will benefit by the large expenditure for new Federal buildings, the design and construction of which come under the authority of the Supervising Architect's office of the Treasury.

For the purpose of spreading employment as far as possible among architects and engineers who, prefer-

(Continued on Page 23)

* * *

NATIONAL COUNCIL OF STATE BOARDS OF ENGINEERING

Report of 1933 Annual Convention

(Continued from Previous Issue)

The Convention of the National Council unanimously adopted an amended constitution and by-laws, providing for the many activities in which the Council is now interested. The following extracts indicate the nature of work which is being undertaken by this organization:

PURPOSE

"The purpose of this Council shall be to promote the public welfare by improvement of professional engineering standards through uniform administration of State Engineering Registration Laws, the facilitating of reciprocal relations between State Boards, and by defining and maintaining National Qualifications for Registration."

(Continued on Page 24)

* * *

ENGINEERS ON THE ECONOMIC FRONT

From the Christian Science Monitor of July 18th.

Recent spectacular emphasis upon governmental powers and programs has obscured somewhat the part the engineering profession is destined to play in world recovery. While seeking legislation by which governmental forces could be organized to grapple with the vast economic problems of the hour, stress naturally was laid upon the major political obstacles to be overcome. These will occupy the center of the stage for some time in international affairs; but government will not suffice of itself to win the complete victory over depression,

(Continued on Page 24)

EXAMINATION QUESTIONS

For License To Practice Engineering

New York—January 30th to February 2nd, 1933

Part II
MECHANICAL ENGINEERING
(Second half)

Thursday, February 2, 1933—1:15 to 4:15 p. m., only

No reference books or notes may be used. Return this sheet with your answer papers.

Select some engineering project that you have designed or helped to design or that you have had responsibility in constructing, write a complete description of it, giving figures, details, sketches, etc., and describe the engineering problems you had to solve and how you solved them. In case you have been interested in an investigation or in some engineering research, you may select this as your subject. Remember that you have three hours for this paper, so take plenty of time in planning what you wish to say and in determining the order of presentation, and then write your paper carefully.

Part II
ELECTRICAL ENGINEERING
(First half)

Thursday, February 2, 1933—9:15 a .m. to 12:15 p. m., only

Answer any five of the following questions. Slide rule and any reference books may be used. Return these questions with your answer papers.

Return at 1:15 p. m. for the second half of this examination.

1 Describe construction, theory of action, and use of the thyrite, autovalve or oxide-film lightning arrester.

2 A feeder of rubber-insulated copper wire supplies a 220-volt, three-wire distribution panel located 120 feet from a service box, feeding 100 50-watt incandescent lamps, 10 5-ampere arc lamps and a 15-hp. 220-volt motor of 90% efficiency at full load. Determine the size of feeder if the voltage drop is limited to 3%.

3 The maximum demand of power by a group of induction motors is 5000 kilowatts at 70% lagging power factor. Calculate the kilovolt-ampere capacity of a synchronous condenser necessary to obtain unity power factor for the total load. Assume the power factor of the synchronous condenser as 10%.

4 The following things are known about a shunt and a series motor when operating at normal line potential:

	Shunt	*Series*
Armature resistance		0.2 ohm
Series field resistance		0.1 ohm
Line voltage	110 volts	110 volts
Armature current when torque T is developed	20 amperes	20 amperes
Speed when torque T is developed	1200 r.p.m.	1200 r.p.m.

A resistance of 2 ohms is then connected in series with each armature. Calculate the speeds of the motors for the same torque, T, previously mentioned, under the new conditions.

5 A certain 25-hp., 220-volt shunt motor has a combined friction, windage and core loss (stray power) of 1400 watts, an exciting or field current of 3 amperes and a resistance of armature circuit of 0.11 ohm. Calculate the efficiency and output in horsepower for an input current of 100 amperes.

6 *a* In the modern networks connecting various power plants, what is the procedure to hold normal frequency and power division?

b Of what use are reactors in feeders and in generator lines?

7 Discuss the theory and application of instrument transformers. What precaution would you take if a meter in the secondary side of a current transformer had to be changed while the feeder (primary circuit) carried current? Explain.

8 Two transformers are to be operated in multiple on both primary and secondary sides. State and explain what conditions must be fulfilled for satisfactory operation.

9 A resonance curve is taken for a circuit having resistance, inductance and capacitance, and it is desired to measure the resistance of the circuit. The impressed alternating voltage is kept constant and its frequency is maintained at one million cycles per second. The capacitance of the circuit is varied and the current squared (I^2) is observed. At resonance, $I^2 = 100$. At the two instances when $I^2 = 50$, the condenser settings are 200 and 250 micro-microfarads respectively. Calculate the resistance of the circuit.

10 *a* Draw a family of plate-current versus grid-voltage curves for a triode.

b Select an operating point on the curves of your sketch in answer to part *a* and show how *each* of the following factors may be deduced directly and independently from the graph: (1) amplification factor, (2) plate resistance (3) mutual conductance.

Part II
ELECTRICAL ENGINEERING
(Second half)

Thursday, February 2, 1933—1:15 to 4:15 p. m., only

Answer any five of the following questions. Slide rule and any reference books may be used. Return these questions with your answer papers.

11 Is it permissible to operate a 60-cycle transformer at 25 cycles, or a 25-cycle transformer at 60 cycles? Explain your answers fully.

12 State the commercial methods by which alternating current may be changed to direct current, explaining the advantages and limitations of each method. What is a Thyratron tube?

13 It is desired that the voltage of a 500-kw., 600-volt, compound generator (short shunt) increase from 550 volts at no load to 600 volts at rated load. With the series field out of circuit and the shunt field excited from an external source, it is found that this increase of voltage may be obtained by increasing the shunt-field current from 10.5 to 18.0 amperes. There are 220 shunt turns per pole and 6½ series turns per pole. The total series field resistance is 0.015 ohm. What must be the resistance of a shunt or diverter to be connected across the series field?

14 The three line voltages of a three-phase system are $E_{AB} = 100 + j0$; $E_{BC} = -50 + j86.6$; and $E_{CA} = -50 - j86.6$. A balanced three-phase "Wye" load of $Z = 10 + j20$ (per phase) is connected to these lines. Derive the complex expression for each line current.

15 How are the propulsion and signal currents separated in an electric railway that uses both rails for returning the propulsion current to the generating station? Make a diagram of the circuit and explain its operation in detail.

16 State the purpose of *each* of the following:

a Permanent magnets used in telephone receivers.

b Condensers and induction coils used in common-battery telephone subscribers' sets.

c Loading coils used in telephone lines and cables.

17 Explain the carrier-current method for increasing the message-carrying capacity of telephone and telegraph lines. State what devices are needed in such systems and how these devices function.

18 Give the theory of electric wave transmission over power or communication circuits, and explain the terms *attenuation constant* and *surge impedance.*

19 What is the most satisfactory type of a. c. motor for general industrial service? What is the most satisfactory type of d. c. motor? State the specific advantages and disadvantages of each, arranging answers in tabular form.

20 How is the type of luminaire, the size of lamp and the number and spacing of outlets determined for the lighting of a general office?

NEW YORK NEWS AND ACTIVITIES

T. Hayden Hamilton, Associate Editor

PRESIDENT CHAPMAN A PIONEER

Since 1916 — Seeking Recognition for Profession

When the New York State Constitutional Convention had under consideration consolidation of state departments and bureaus, Arnold G. Chapman, then Chairman of the Legislative Committee of the Albany Society of Engineers, sought to bring about a concerted movement upon the part of Engineers, with a view to having incorporated in the new constitution an autonomous department charged with the control of all state engineering projects. Because of lack of co-operation from Engineers and the divergent opinions of certain engineering societies the result was not accomplished.

Subsequent to the adoption of the new State Constitution, Mr. Chapman sought, practically single handed, to have the legislature provide that the Department of Public Works should be headed by an Engineer of experience in planning and administering large engineering projects. At this time many men in charge of public works, especially highway construction, had little if any engineering knowledge or experience. As in the previous endeavor, lack of support resulted in failure to secure recognition.

In practically every endeavor within the State, wherein recognition and adequate compensation for Engineers were concerned, he was for ten years prior to the formation of the New York State Society a willing collaborator and an ardent supporter.

Perhaps no Engineer appreciated better than he the problems to be surmounted in order to secure recognition for the profession, and none was more cognizant of the indifference, and frequently the opposition, of existing engineering agencies, toward any effort tending to improve the professional and social status of the Engineer.

When the New York State Society of Professional Engineers was organized, Arnold Chapman became one of its earliest and most ardent supporters. During the term of President Sheridan he was made Chairman of the Legislative Committee, engaged in seeking to amend and strengthen the law. He was reappointed by President Steinman and has been in charge of all engineering legislation proposed in this State since 1928.

During this period the Engineer has received more recognition from the legislature and from the people of New York than in the previous hundred years. The form of organization of the State Society lent itself readily to the campaign plans of Mr. Chapman and within a period of about four years practically every legislator in this State had been contacted, interviewed and instructed concerning the problems and aspirations of the professional Engineer. Throughout all endeavors to create a worth while practice act, and to protect the Engineer against discriminatory legislation, he maintained a position that commanded the good will and respect of all. Together with Senator Desmond, Past Presidents Steinman and Sheridan, the State Education authorities and the Architects' representatives he worked ceaselessly to place on the statute books of New York a law which is today something of a model for the rest of the country.

During every legislative session of the past few years Mr. Chapman was on call practically twenty-four hours a day. Day and night conferences and discussions, with representatives of the State Education Department, members of the legislature, Engineers, Architects and others, was the order of things, until the legislature convened and the Governor approved or vetoed its proposals.

Few persons could have maintained a more unbiased position throughout the somewhat stormy campaign of the years referred to. To reconcile the views of men in Buffalo, Watertown, Albany and New York is a difficult task. To arouse the support of upper New York in order to overcome the discriminatory Section 300 of the Multiple Dwelling Act, affecting Engineers in the City of New York only, was an accomplishment as well as a tribute to the unifying influence of the Society where members in any part of the State stand ready to rush to the support of those in any other part. In all the campaigning he played an unassailable role.

Arnold Chapman entered the service of the State of New York as a Chainman, rising as a result of examination to the highest civil service classification, from which he was appointed Deputy State Engineer, an office he held for five years. Subsequent to his incumbency of this office he was engaged as Engineer for flood abatement and channel improvements for practically all projects of magnitude, within the State including those at Hornell, Canisteo and Olean on the Allegheny River, as well as those along the Canisteo River.

He has been engaged in engineering activities involving water supply, sewage disposal and terminal improvements as well as investigations and reports for bridging the St. Lawrence River, a project about to be consummated with William F. Fields and Dr. D. B. Steinman as Engineers thereof. In 1928 he was appointed Chief Engineer of the Albany Port District Commission, which position he still occupies. This Commission has completed a $10,000,000 development making Albany a real terminus for ocean going vessels, railroads and airways.

Since the organization of the National Committee for Trade Recovery in 1932 Mr. Chapman has served as Chairman of the Eastern New York District Committee. His record suggests his qualities for leadership of the Society.

REPORT OF COMMITTEE ON CHAPTER ACTIVITIES

Following is a report of the major activities of the Chapters of the New York State Society since the Winter meeting held in Albany in February:

Leadership in a co-operative endeavor by professional, civic and trade groups to establish a new County Building Code has been taken by one (1) Chapter.

Studies of the Proposed Building Code of the City of New York have been made by three (3) Chapters.

Studies preparatory to the anticipated revision of the Charter of the City of New York are being made by three (3) Chapters.

A study of existing Zoning Regulations is being made by one (1) Chapter.

Studies of proposed grade crossing eliminations are being made by two (2) Chapters.

Leadership in a campaign supported by professional and civic organizations for the construction of a rapid transit tunnel connecting three (3) Counties is being taken by one (1) Chapter.

A co-operative endeavor has been made by four (4) Chapters and associated civic and business-men's organizations urging the resumption of work on the Tri-Borough Bridge connecting three (3) Counties in New York City.

The adoption of a comprehensive Federal Public Works Program has been urged by three (3) cooperating Chapters.

The creation of a Federal Public Works Department to plan and direct all Federal construction work has been urged by one (1) Chapter.

The construction of revenue-producing Public Works by private capital when public funds are not available has been recommended by one (1) Chapter.

Legislative inquiries into the widespread curtailment of public-works and the consequent unemployment of Engineers and skilled and unskilled labor in the manufacture and use of materials of construction have been petitioned for by two (2) Chapters.

A protest against the disproportionate reduction of engineering forces during the depression period has been made by one (1) Chapter.

Protests against the diversion of gasoline and motor vehicle tax funds to uses other than highway construction purposes have been made by three (3) Chapters.

The submission of concrete suggestions to governmental officials to relieve unemployment among Engineers has been made by one (1) Chapter.

Protests against the discharge of qualified Engineers and the employment of unqualified "work relief men" on Engineering work have been made by three (3) Chapters.

Representations to the effect that

(Continued on Page 25)

NEW JERSEY NEWS AND ACTIVITIES

Gerald W. Knight, Associate Editor

ETHICS—WHY?

Richard H. Lowe, Attorney and Engineer, Counsel to the N. J. Association

In this period of economic unrest, it is difficult to insist upon a strict application of the canons of professional ethics when every one of us must of necessity exert himself to the utmost in order to secure sufficient gainful occupation to procure the necessities of life for himself and his dependents. With the single alternative—Dollars on one side, and Ethics on the other, we find in nearly every case the code of ethics shunted to the background.

How can we expect an application of ethics when by a slight departure therefrom we can achieve financial solace. The profession of the engineer has many temptations which beset his path and tend to swerve him from the line of strict integrity, because of the delicate and difficult questions which are continually arising. There are pitfalls at every step and the mere youth at the very outset of his career needs often the prudence and self-denial, as well as the moral courage, which belong commonly to riper years. High moral principal is the only safe guide, the only torch to light his way amidst darkness and chaos.

Craftiness is the vice, not the spirit of the profession. Trickery is professional prostitution; falsehood is professional apostasy. Truth and integrity can do more in the profession than the subtlest and wiliest devices. The power of integrity is the rule, the power of fraud is the exception.

The general law of the profession is duty, not success. In it, as elsewhere in human life, the judgment of success is but the verdict of little minds. Professional duty faithfully and well performed is the engineers' glory. It is time for us to enforce a moral tone in the profession which will drive all non-conforming members out of it.

The engineering profession, because of the diversification in occupation and affiliation of its members, has never been so well knit as some of the other professions. It is difficult to obtain professional unity. We have our engineers' societies and our local chapters, but we do not participate in united form in any of the important problems in which our governments are interested. As an organization we are never asked for approval or disapproval of a project in which we, as engineers, have a direct interest. We have never set up in our associations and societies a group which would cooperate with governmental officials and act as an engineering advisory body.

There are reasons for such a condition. The employment of technical experts is a valuable part of political patronage and it answers the purposes of political manipulation better to engage a technical man for advice which will meet political demands, than to secure an unbiased consideration from a society. We are never permitted, as an organization, to suggest nominations for engineering offices of the government or for examining boards and the like, as are other professional bodies, for example the Medical Association. The New Jersey Association of Professional Engineers has a committee on ethics and prosecutions which to date has received nothing but a few minor reports of grievances. Some of these may have been personal, at any rate we have not been able to establish one violation of the licensing laws or of our code of ethics because of the unwillingness of those members in possession of the facts to align themselves with a group campaigning against possible wrongs when by such alignment they might jeopardize their personal procurement of an engineering position, in future.

Our state organization can not make itself felt in the activities of the state. And by this, political activity is not meant. Let us divorce ourselves as an organization from practical politics and proceed on the broad ground of good Government as exemplified by an active, serious interest in those things which will insure the best result for all concerned.

A code of ethics cannot particularize all of the duties of the Engineer in the various phases or relations of professional life, but we can so deport ourselves that the conduct and motives of the members of our profession will be such as to merit the approval of all just men.

The need for a code of ethics is quite apparent. The Medical and Legal Associations have such canons and endeavor to punish infractions of the rules. Were we more closely knit and more personally proud of our name "Engineer" and our reputations as such, we would strive for a solidarity of body and purpose that would defy disintegration.

* * *

CHAPTERS ADJOURN

Take Summer Recess

With the advent of warm weather most Chapters have followed the seasonal bent and suspended business meetings.

In place of regular gatherings there have been substituted social activities in order to promote contacts and develop friendly relations.

Monmouth County Chapter is staging an outing to be held at the Shark River Hotel, near Belmar. It has extended an invitation to all Chapters and promises those who attend an occasion to remember.

The South Jersey Chpater held a splendid meeting in the form of an all day and evening get together. Golf, bathing, boating and other activities afforded an opportunity for all to become acquainted. Engineers and their families from various parts participated and the occasion proved a most pleasant one for all.

Passaic County Chapter, as is noted elsewhere, has already held one social gathering in the form of a golf tournament and dinner. The same proved so successful that another one i scheduled for August 19th.

These activities indicate a healthy Chapter condition and will doubtless promote a spirit that will tend to increase the Engineer's desire to participate in those phases of existence which he has in past too greatly neglected, namely the social and pol cal.

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ENGINEERS AGAIN HIT

By State Highway Reorganization

A proposed reorganization of the State Highway Commission will abolish engineering offices at Camden, Jersey City and Newark.

Nearly 400 positions, together with a 33% salary cut, is expected to recoup $820,000. The salary cut is in addition to the 10% which is already in effect.

Practically one half of the so-called saving will come from the salaries of Engineers. When will the dismemberment of the profession cease. An effort must be made to arouse public opinion to a realization that engineering is far more essential to civilization than promiscuous widespread education.

* * *

RADIO PLANS

With the close of the Association's radio program on July 21st, a breathing spell will afford an opportunity to prepare the details for next Fall and Winter.

The success of the season just closed was most heartening. That it should be continued permits of no questioning. Supported by such arguments the Committee has already mapped out one of the most ambitious programs that any professional group has ever attempted. A series of addresses to cover one entire year has been arranged for. These addresses will be delivered over a prominent metropolitan station and will be in addition to the Romance of Engineering to be presented over the Columbia Network.

* * *

PASSAIC COUNTY

From E. F. WEEKS

A golf tournament for Passaic County Engineers was held under the auspices of the Chapter on Saturday, July 15th.

A large attendance enjoyed the (golf?). An appetizer, in the form of welcome refreshments, provided a splendid atmosphere for the dinner which followed.

The first golf prize was won by Neil Holdredge of Pompton, with Gerald Knight of Passaic as runner-up. A novelty match, wherein Gerald Knight spotted Russel Wise one stroke a hole

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Engineers and Codes

(Continued from Page 5)

deliberations before making a decision. If the minimum compensation, in the form of salaries and fees, could be placed on a plane commensurate with the value of engineering services, and a schedule of such could receive the approval that would make it effective, the professional engineer would on the whole benefit greatly. Also, if a Code would cause employers, clients and governmental agencies to universally recognize Engineers as professional men and would at the same time require that all work of an engineering character, especially that termed executive, be performed, and directed by professional Engineers the results would greatly benefit both public and profession. The question is—Would such results be obtained?

At the moment there appears to be a neutral position which is receiving attention. There are many industries wherein the Engineer plays an important, though generally poorly recognized, part. These industries are being coded. The Engineer must, in self protection, scrutinize the codes of the various industries. Nothing prejudicial to his desire to remain uncoded, or his right to draft his own code, should be incorporated in other codes. If compensation and conditions of employment for Engineers are to be regulated, the Engineer himself should play the leading role in making and setting up standards.

It is extremely probable that Engineers and Architects will, in some manner, have to be provided for in the Code for the construction industry. Appreciating this, various engineering groups, including the New York State Society of Professional Engineers, have been studying the problem, and to date several tentative codes have been prepared by Engineers in the event that codification, either directly or indirectly, becomes necessary. No code should, of course, be presented as representing the profession's viewpoint unless the same has been generally approved by the various professional groups. At the same time no group, not composed entirely of professional Engineers, should be recognized as having the right to speak as a professional organization.

The professional status of an Engineer is determined by law in more than half the states and territories. In the remainder, membership in, or eligibility for membership in, a national engineering society of recognized standing should be required as a credential for professional status.

In addition to the professional Engineer there is the professional Engineering Assistant, whose welfare is the concern of the profession to which he seeks eventual admission. While there may be a division of opinion as to the advisability of a Code for the professional Engineer there can be little doubt concerning the desirability for including the professional Engineering Assistant within the scope of the Recovery Act's regulatory scheme.

If there is reason to fear that the professional Engineer might be included in the so-called white collar schedule with its $14 a week minimum, there is much more justification for believing that the professional Engineering Assistant might be so included. The minimum set to-date in all industries is pitifully small. It is the one criticism that can be directed at the President's proposals. While better than previous wages, $14 a week is an inhuman compensation to offer any man or woman compelled to take care of himself or herself and perhaps others. One had hoped to see the end of economic slavery. The professional Engineering Assistant must be kept out of any such category.

Perhaps the Recovery Act will afford an opportunity for the professional Assistant to create minimum standards of compensation that will grant him a status to which he is entitled and a better one than he has heretofore enjoyed. The professional Engineer must aid his sub-professional brethren and collaborate in preparing a Code commensurate with the latter's place in the scheme for national recovery; and one that will assure him of compensation and employment conditions at least comparable with those of skilled mechanics. If the profession fails to offer its services in this instance, organized labor will probably step into the breach. The professional Engineer and the professional Engineering Assistant have too much in common to warrant unionizing sub-professional engineers.

For the sake of making clear the line of demarcation between the professional Engineer and the professional Engineering Assistant the following definitions are suggested:

> A professional Engineer shall be any person, licensed in accordance with the provisions of law to practice professional engineering, or any subdivision thereof, within any state or territory of the United States, or, any person admitted to, or eligible for admission to, corporate membership in The American Society of Civil Engineers, The American Society of Mechanical Engineers, The American Institute of Electrical Engineers, The American Society of Chemical Engineers, The American Institute of Mining and Metallurgical Engineers or The American Association of Engineers, who is practicing legally in any state or territory of the United States.
>
> A professional Engineering Assistant shall be any person who, not licensed by any state or territory to practice engineering as a profession and not eligible for corporate membership in one of the national engineering societies above listed, is employed to render technical or scientific services of a sub-professional kind under the direction of a professional Engineer.

Let the professional Engineer be on his guard, both to protect himself and to assist those who one day hope to enter the profession which, as civilization's greatest agent, is entitled to society's generous consideration.

Straight Thinking

(Continued from Page 6)

Let us consider just a few examples of very curious and seemingly crooked thinking that threaten unfortunate results. We may well start with the agricultural situation since it is at the present minute much in the public eye. For years we have paid taxes to our state and federal governments to support them in the development of new species and new methods capable of increasing greatly the yield per acre of agricultural land. At the same time we have also paid the Federal Government taxes for the purpose of making it possible to bring marginal land under cultivation, principally through provisions for irrigation. During the same time we have paid taxes to cover studies into the reasons why farmers were leaving the farms. Recently we have spent huge sums in attempting to maintain fictitiously high prices for certain farm products. Now our national law makers are engaged in discussing further strange and curious means intended to do the same thing. Having paid good money to put us in position to produce in excess of the demand, we are now engaged in what is equivalent to an attempt to repeal the law of supply and demand.

It does not appear to have occurred to anyone that straight thinking in connection with such matters requires that some balance should be struck between the total usable quantity of agricultural products and the expectable yield from existing lands with the improved stocks and improved methods, before we could justify the expenditure of public funds for increasing available acreage by bringing in lands of marginal character. It does not appear to have occurred to anyone that straight thinking requires that some balance be struck between the money expended for developing such new stocks and methods and the economic value of the results.

There are many other aspects of this very large problem, such as the effects of modern refrigeration and modern transportation methods. But, even if we ignore these, it is patent that we have been guilty of very loose thinking, one might almost say absence of thought, with respect to certain very fundamental matters. All human experience tends to show that in the end the law of supply and demand is just as potent and just as inexorable as the law of gravity. The engineer would accept that fact and would attempt to construct within such limitations as it places upon his activities. Law makers and many others do not appear to recognize such a necessity.

It is curious that the engineer has not even thought it necessary to raise his voice during many years of apparently unjustifiable expenditures in the field of agriculture, if indeed, he even took the trouble to learn enough about the actions of his elected representatives to know that they were making such expenditures. Certainly had the engineer applied his professional methods to his responsibilities as a citizen he would long ago have questioned the sanity of much of our

agricultural policy and of the resultant expenditures. Note please, that it is not necessary to audibly question things and acts that will not bear unbiased analysis on a common sense factual basis. And note also that it is not necessary to go into politics to do this.

Again, take the matter of transportation. The Federal Government and certain local governments have spent taxes freely on the development of harbors, waterways and other things tending to foster and to cheapen water-borne commerce. Within the past two decades various governmental units have spent money lavishly in building paved roads for the comparatively free use of automobiles, trucks, and buses in paralleling our principal steam railroad and electric railroad lines. At the minute, numerous governmental units are spending money in the development of airports, airways, and other instrumentalities for the improving and cheapening of aerial transport and commerce. It does not appear to have occurred to anyone to ask certain pertinent questions and to insist upon rationally developed answers before submitting to such taxation. For example, one might ask whether, after the development of such facilities out of taxes, there will be enough demand for transportation to utilize them all. If not, can the railroads survive? If they cannot, can we get along without them?

It does not appear to have occurred to many that much of the present structure of our civilization is built upon the assumption of the continued solvency of our steam railroads. For example, we put our money in savings banks and we invest prudently in life insurance, the while we are busy undermining the values upon which the integrity of such structures and the safety of our money and provisions for the future depend.

Instead of considering such matters in a common sense fashion and on the basis of facts, we join the mob in its inherent mistrust of such large organizations as the steam railroads, we jump to the conclusion that their charges are too high, that they will throttle us if they can, and that we should teach them a lesson that they will not forget. The possibility that we are seriously injuring ourselves and our own best interests never enters our heads because we are swayed by passion and not by reason. It is to problems of this sort that the kind of thinking the engineer does when solving problems of an engineering character would be very fruitful.

Please understand that the writer is not defending the railroads. He believes that they have been exceedingly shortsighted in many respects. They still do altogether too many things as they were done ten and fifteen and twenty years ago. C. F. Kettering, of General Motors fame, is fond of exemplifying this matter by stating that there has been only one major improvement in Pullman cars in the last two decades and that consists of the introduction of a slot in the wall of the car through which one may dispose of razor blades. Of course things are not quite so bad as this would imply, but they are bad enough. The steam railroads certainly have not made such advances in engineering, in methods, and in public relations as might legitimately have been expected of them in recent years. They have become too greatly inbred and they need an infusion of new blood. But, until we are satisfied that we can do without them we should be using our energies in forcing them to improved service rather than in hounding them to death. And the author is convinced that we cannot do without them.

As another example in this field we might consider urban transportation. Not so very long ago the electrified street railway was practically the only means of getting about in a city of any size. Then came the automobile and after that the motor bus. In recent years we have been very busily engaged in spending huge sums of money to improve and widen streets so that such automobiles and buses may move more freely from place to place. It is now popularly supposed that the day of the rail car is over and that private automobiles, buses and taxicabs can supply all the transportation facilities that will be required in the future. Therefore, communities are urging that rails be removed from the streets and with them the lumbering and noisy street cars. But, it does not appear to have dawned upon any of our leaders of public opinion to investigate before acting and to determine whether the underlying assumption is a correct one.

A very brief consideration of the facts shows a number of interesting things. At present, as an average over this country, between six and seven people out of every 10 are dependent upon some form of public urban transportation. The assumption made by some molders of public opinion to the effect that the private automobile and taxicab will ultimately replace all forms of public conveyance is so far from possible as to be ridiculous. Neglecting the question of fares, studies made in representative cities show that there could be no business district under such conditions because the street space required for automobile flow would occupy the entire area. However, it is not necessary to go as far as this. Even less radical assumptions are shown to be at present impossible of attainment. The tax burdens that have been loaded recently upon the shoulders of city dwellers for the widening of streets and the building of special automobile arteries speak for themselves. It may tickle civic pride to spend from $500,000.00 to $5,000,000.00 a mile in widening streets and building special highways to produce a passenger capacity of about 4,000 persons an hour in one direction as against permitting a private company to spend about $100,000.00 to $150,000.00 a mile to produce a passenger capacity about three times as great. But, civic pride cannot stand long in the face of impossible levels of taxation.

We are just beginning to appreciate the effects that such buses are having on street capacity and on street paving. Almost every city in which modern buses are now operating as an essential part of the public transportation system will shortly discover itself faced with tremendous expenditures for replacing deteriorated pavements. And then, you may expect to see the bus lines loaded with much heavier taxes in an effort to make them shoulder this item of expense. Most of the states have already discovered the effects of large buses upon improved highways and are engaged in passing restrictive legislation as to dimensions, weights and even speeds in addition to increasing the tax burden. Such state laws are already in effect in some cities by virtue of the fact that these cities have accepted state aid in defraying the costs of widening and paving arterial highways. And it will not take a great increase in the operating and overhead charges to make many bus lines much less promising investments than they are now popularly supposed to be. We have accepted without any real investigation a great deal of half baked information about the relative virtues of urban bus versus urban rail transportation.

Another large question now under political discussion is the St. Lawrence waterway and its associated hydro-electric power plants. In spite of the fact that the writer is a fairly wide reader, he confesses that he knows nothing about the rights and wrongs of the waterway part of this project. If required to vote upon it now, he should have to do so in absolute ignorance of essential facts. It appears that a waterway which is open only part of the year is to carry a large part of certain kinds of freight now moved during that part of the year by the steam railroads. Then, when the waterway is closed by ice, the good old railroads are expected to be on the job to render the necessary service. It may be that by the time this waterway is finished shipments of freight will have grown so large that both it and the railroads will be needed and can get enough business to support both. One does not know. But has any attempt been made to justify the expenditure on such a basis?

The author is in a better position to form judgments regarding the proposed hydroelectric features of the development. He has been greatly amused by a pretty political game. The engineers who worked out the probable costs of the hydroelectric part of the project arrived at a figure which is believed by some experts to be too low. In spite of this fact certain politicians insist that the first cost should be and shall be much lower. You must understand that the parts of the investment charged respectively to waterway and hydro plants must add up to the total expended, but that there is a possibility for honest differences of opinion regarding allocation. Now it so happens that the part of the total estimated cost which originally was allocated by the engineers to hydroelectric developments was of such magnitude that with any reasonable set of assumptions the power cost was such as not to be competitive with steam at any great distance from the river. Such a result did not meet the political needs in the case and led to long discussions and questionable compromises until, now, it becomes poss-

ible for the advocates of the installation to announce St. Lawrence river power at a competitive price in New York City. All the assumptions necessary to arrive at such figures are not accepted by experienced utility executives as reasonable or safe, but they make a good story on paper.

Problems of this character have two aspects. One is the purely economic one which is generally such that reasonably accurate analysis is possible. We are justified in insisting that this aspect be thoroughly investigated on a factual and not a political basis before action is taken. The other aspect is quite different. It is social in character. It may be quite a proper function of government to provide certain utility and possibly other services at less than actual cost and to make up the loss through taxation. If the government is to do such things the public should be given an opportunity to know how much of a loss it is expected to pay out of taxes and should make its decision on that basis. And, it should later be given an opportunity to learn from non-partisan sources the amount that is actually paid out of taxes.

Let us look for a minute at another peculiar set of phenomena. Not so long ago numbers of people bought stocks of various corporations at inflated prices. When the bottom dropped out of the stock market we did not assume that it was any business of the government to rescue these unfortunate gamblers. They had bought something for more than it was worth, frequently using credit of some form to cover part of the transaction. They had used poor judgment and should pay the consequences was the judgment of the country.

At and before the day of making such investments many farmers had purchased farms at inflated values. Later the bottom dropped out of the agricultural market. Immediately we discovered that while speculation in Wall Street is reprehensible, speculation by farmers in farm lands is to be protected. Some thinking individuals even contend that we must write down the face value of the mortgage to preserve an equality between it and the value of farm products. We had no such suggestions respecting notes in banks when those notes had been used to buy stocks and bonds.

You may say there is a difference. There is one of degree but not one of kind in any basic sense. But let us go further. Certain European nations owe us large debts contracted at a time when money was much cheaper than it is now. Most of us have strenuously objected to according these nations treatment similar to that we are advocating for our harassed farmers. If it were not all so terribly serious it would be really ludicrous. Certainly a bit of thought of the engineer's type might profitably be applied to some of these problems.

Now you may well ask where all this is leading. You may be suspecting that one is going to suggest that the engineer should leave his present fields of endeavor and take over work in other fields that have commonly been tilled by others. This is far from the intention. There is much virtue in the old saying that the shoemaker should stick to his last. The writer for one, does not believe the engineer capable of solving all the problems of the modern social organization, the Technocrats to the contrary notwithstanding.

But, this does not mean that the engineer should apply his thinking process only to engineering problems and then travel with the mob in the consideration of problems which fall outside his field but the solutions of which affect him as they do others in all walks of life. The engineer, as an individual, is an integral part of the social structure. He is affected by laws controlling this and that; his welfare is intimately wrapped up with that of all other members of society; an industrial depression is as significant to him as to all others. A gradual disintegration of our democracy would affect him to the same extent that it would all other members of the community. He is a citizen and voter and thus charged with the responsibility not only of voting but of voting wisely.

It is a fact that politicians can in general remain politicians only as they or those that they support are elected to office. And it is also a fact that through the ages the successful politician has usually owed his continued success more to catering to mob psychology and class consciousness or class prejudice than to the wise and beneficent handling of the problems that he professed to be solving. It is easy to arouse the ire of the mass against the supposedly heartless and money-gorged steam railroad or other large corporation and to persuade the mass to vent that ire in the passage of highly restrictive laws, provided one is not bound to call attention to the fact that the payment of insurance on the health and lives of that same mass is in no small measure dependent upon the continued financial integrity of the same large corporation.

It is easy to persuade the mass to confiscate the private property of the wealthy in order to reduce the taxes of the poor, provided one does not have to tell the mass at the same time that this is equivalent to dispersing the capital goods upon whose continued existence the wages and lives of the poor depend.

The politician will undoubtedly be always like this. He must be. But, unless one is much mistaken, civilization has changed recently and rapidly to such a type that purely political handling of its larger problems for political ends must lead to disastrous results. Governmental units are too well interlocked, distances are too greatly reduced, industry is too closely knit, interests are too common to permit the purely political handling of our larger problems. Things move so rapidly these days that a major error made today may be reflected over the country or around the world tomorrow. What are we going to do about it?

Certainly we are not going to get rid of the politician. Certainly we are not going to convert him suddenly into an unselfish, party-ignoring teller of the truth. Certainly we are not going to change human nature over night or even in a few years. Certainly we are not going to be able to, educate the masses to the solution of problems which baffle even the wisest.

If improvement comes, it must come through a realization on the part of the thinking people of our communities that certain problems of major character require different treatment, followed by insistence that they be given such treatment. The politician is a sensitive soul when it comes to sensing changes in the ways or thought of the public and experience shows that to some extent he can be trusted to keep hands off things that the public insists shall be free of political taint.

One is satisfied that it is possible to bring about fairly expeditiously a condition of affairs in which certain problems of major character and importance will be accepted as of such vital significance that they must be handled without any particular reference to political advantage except as this can be obtained as an incidental by-product. In fact, the writer believes we are already fairly far along the road to such a condition and that if we will only become fully conscious of the need, we can accomplish the end reasonably quickly, so that straight thinking shall be applied to those social, economic, and political problems in connection with which its use is imperatively necessary for the public weal.

Undoubtedly one will ask justification for this contention. Look back over the history of the past 20 years and ascertain how many times we have used outstanding citizens either as individuals or as committees to carry through negotiations or to study and report upon problems which in early days would have been handled partly or wholly in the light of political expediency. It is suggested that engineers study the increasing degree to which the better leaders in government are beginning to draw in, as consultants, specialists in various fields of human endeavor. Let one suggest that you ascertain the extent to which the Chamber of Commerce of the United States has recently studied large public questions from as nearly a non-partisan view as can be maintained. Note also the extent to which competent specialists in many broad fields of human endeavor have taken to the preparation of popular discussions of live questions of public import and the extent to which such treatises are educating the public and assisting it in formulating its ideas.

Of this the writer is confident:—we have already gone about as far as we dare go with the methods of the past. No public of the size of ours and of the character of ours can, unguided, develop the wisdom required for the solution of the major problems of this phase of the current civilization. Nor does experience show that, in any general sense, those elected to office have the wisdom, or possibly even the intelligence and education, necessary to enable them to study large public questions exhaustively, to say nothing of assisting the public in acquiring the viewpoints and information required for reaching correct solutions. Nor

does experience lead to the belief that if we adhere to present methods, we shall succeed in electing better men to office in sufficient numbers to produce radically better results.

Only one promising way out is manifest and that has been indicated. It will come into effective operation just as soon as a sufficient number insists that straight thinking underlie action and legislation dealing with large questions of major character.

Engineers are generally speaking by nature endowed and by education equipped to do straight thinking in their chosen field. As such, they are in position to recognize better than any other single group the failure to use similar thought processes in other fields. One does not for one minute assume that most engineers know or will ever know enough outside the field of engineering to enable them to think through to true solutions the complex social and economic problems that beset modern civilization. But it is safe to assume that many have developed and will continue to use mental processes that will enable them to do two important things. These are, first, to recognize their own ignorance with respect to the facts and proper solutions of many questions of public import and second, to differentiate between illogical, partisan, and emotional treatments on the one hand and logical, non-partisan, and scientific treatments on the other.

Others cannot be taught this method quickly. In fact, few outside the fields of science and engineering appreciate that there is such a method available. How then is the engineer to utilize the advantage that his peculiar discipline gives him? Certainly not by attempting to solve the problems himself and certainly not by attempting the impossible education of the politician or the mass of the public in his methods. What then?

First, one would urge upon engineers a more complete and effective realization of their two fold capacity; that of an engineer and that of a citizen. Second, one would urge that they recognize that the proper discharge of obligations as a citizen is just as important in the long run as engineering activities, possibly even more so. Third, it is essential that, in the capacity of citizens engineers attempt to apply the engineering type of thought and attack to the public questions that are up for discussion and decision. Fourth, time should be taken to determine whether proposed actions and solutions are really based on ascertained fact or represent merely the results of emotional reactions or guesswork or political expediency. Fifth, bring to public attention those cases of real importance in which the necessary facts have not been determined and published before action is taken. And, sixth, influence those contacted who have not been trained in the same rigorous school of thought so that some of them may ultimately be brought to realize that there are better, safer, and surer ways of handling public affairs than those now most generally employed.

One does not suggest that engineers become crusaders, or that many give up engineering activities to become questionable public leaders. Engineers however should perform their duty as citizens by giving a proper proportion of their time and of their special training to the careful consideration of public questions and of their correct solutions. The onward progress of our civilization is going to be achieved either through straight thinking or through accident or through a combination of both. The writer prefers the maximum possible amount of the straight thinking ingredient; it is certain to be more expeditious and less wasteful in the attainment of results.

In closing a word of caution is appropriate. The social structure is made of human beings and, of necessity, it must continue to be so constituted. It is possible to imagine all sorts of marvelous results provided only that one may at the same time ignore the characteristics of human beings. Many self-appointed architects of the social structure overlook the necessity of building something that is consistent with the characteristics of the building materials available. These errors should be avoided. Straight thinking in matters social and economic requires that, among other considerations, one must recognize that he deals with human beings with all their good and bad, consistent and inconsistent, lovable and hateful attributes. The actions of democracy are the statistical result of the effects of all sorts of stimuli upon these sensitive and erratic organisms.

Whether democracy survives and develops into that which its advocates contend it can, will, be determined by the extent to which mechanisms are worked out and used for the production of the proper stimuli. All that has been said in this article boils down to an exhortation to use certain special qualifications which engineers possess to increase the degree and extent of stimulation in what one believes to be a highly desirable and promising direction.

Note: — The American Engineer makes acknowledgment to the Massachusetts Institute of Technology Review and to Dr. Hirshfield. The views expressed are of course those of the author and are offered as such without comment.

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Legal Tests of Registration

(Continued from Page 7)

the profession without registration under the Statutes, and whose professional acts and contracts are valid so long as they keep within the general law. The Supreme Court raises the question, "Does this classification unwarrantably interfere with the equality of opportunity of "acquiring, possessing and protecting property" by pursuing one's profession, guaranteed by the Constitution?

This need not be discussed at length because it is not the ruling question upon which the Court bases its opinion. However, certain points are made here that it might be well to bring to your attention. The Court reasons that wherever such groupings as are here involved is, on any substantial basis a reasonable one, it is sustainable; but where the grouping presents an unreasonable classification, the question arises as to its effect on the validity of the act in which it is found. They call particular attention to paragraphs (a) and (g) of Section 24 of the Statute. Section (a) exempts from registration:

> "A person not a resident of and having no established place of business in this Commonwealth, offering to practice therein as a Professional Engineer."
>
> Section (g) exempts from registration:
>
> "Officers and employees of a Corporation engaged in interstate commerce as defined in the Act of Congress entitled 'An Act to regulate Commerce' approved February 4, 1887."

The first Section, (a) has the effect of permitting non-resident, unregistered engineers to tender their services and make valid contracts while the resident engineers must register in order to lawfully practice. For this reason the Court held that it is a violation of the guarantee of equality of opportunity provided by the constitution of that State.

The second Section (g) permits officers and employees of corporations engaged in interstate commerce to practice the profession of engineering in Pennsylvania without registration, while requiring all officers and engineers of corporations not engaged in interstate commerce to be registered. In this instance the Court very sensibly reasons that this does not say that officers and engineers are exempt merely while engaged in interstate commerce but that they are wholly exempt from registration and may freely practice the profession of engineering in that State. Thus the court held that these exemptions are of doubtful validity on the ground that they clearly make an unwarranted and unjustifiable classification.

There are five other classes of exemptions in Section 24 of the Act under paragraphs (b), (c), (d), (e), and (f).

The Court says paragraph (b) and (c) are not unreasonable because the exemptions from necessity of registration in these are temporary exemptions in that a person not having an established residence in the State and practicing not to exceed thirty days or a person not having an established residence in the state and has made application for license. Under paragraph (d) the exemption is said to be reasonable because it exempts employees of regularly registered engineers on the theory that such employees are merely assisting the duly registered engineers. Likewise under paragraph (e) the Court finds that the exemption of employees of the federal government may be justified on the ground that the legislature might properly assume the federal government would employ none but qualified engineers.

The conclusions of the Court, as to the reasonableness or unreasonableness enumerated leads to the question of the exemptions effect upon the validity of the statute as a whole. In other words, with the questionable exemptions (a) and (g) stricken out, may the remainder of the act still be upheld? This is the ruling point in the case.

Upon arriving at their conclusion in

answer to this question the Court said that the law is wherever part of an act found to be unconstitutional can it be severed from the rest of the statute without destroying its entirety, such severence may be made and the act sustained, but where the severence would destroy the unity of thought, the whole act necessarily falls. If the part which is void is vital to the whole, or the other provisions are so dependent upon it, and so connected with it, that it may be presumed the legislature would not have passed one without the other, the whole statute is void. So they have found, in the construction of the act under question, that they could not presume that the legislature would have passed the act without including all of the exemptions set out, and as all of these exemptions are inseparable expressions of the legislative will, and since part of them are unconstitutional, the whole act falls.

Thus far the Court has considered the act as though it dealt with only a single subject but they next take up the discussion of the fact that the act contains more than one subject of Legislation; first, that of "Engineering," and next, "land surveying." In the words of the Court:—

> "As the act is drawn, the latter occupation is not treated as a mere subordinate branch of the former. The act constantly refers to the 'profession of engineering,' and usually adds immediately thereafter, 'or of land surveying,' and thus, by using the conjunction "or" and repeating the proposition "of" it conveys the idea of two professions. Furthermore, the act repeatedly refers to 'a professional engineer' and to 'a land surveyor,' and really treats them as separate subjects of legislation."

In further construing the act, the Court finds that Section 2 defines the term "profession engineer" in such a way as not to include "land surveyor," and then immediately afterwards it defines "land surveyor." If it had been the intention of the legislature to include the land surveyor in the definition of engineer, so the Court reasons, they would have made such definition broad enough so that there would have been no necessity for subsequently defining land surveyor. Further, the Court finds, that the act charges a certain fee to register an applicant as a "land surveyor" and a higher fee to register one "both as a professional engineer and as a land surveyor." From the construction given this act by the Court it is apparent that it sets up two subjects of legislation and as this is contrary to the constitution of the State of Pennsylvania the act is unconstitutional.

This Act might have been drawn to divide the profession into different branches without violating the terms of the constitution. In other words, instead of treating the profession of engineering and that of land surveying as separate and independent of each other the act could have included them both, treating the main subject as including minor branches. This could be done by terming the act "An Act to regulate the practice of the profession of engineering, *including* land surveying or any branch thereof," thus making the minor branch subject to the main. Or the Act could have been drawn to include all branches of the profession except certain branches, defining them, and these exceptions would prevent it from violating the terms of the constitution. But in the Act under discussion, as we have seen, it treats of two subjects, and is contrary to the constitution and in the words of the Court said:

> "Here the trouble is not that the instant act contains special regulations for 'professional engineers' and other ıor 'land surveyors,' but that by the language employed, it deliberately treats, . . . both in the title and throughout all its provisions, . . . land surveyors as following an occupation separate and distinct from that of professional engineers, and thus, as we said before, it apparently sets up two subjects of legislation instead of one."

In the last part of the opinion another subject is raised which the Court does not give its opinion, but merely mentioned it, and we call it to your attention. The title states, that it is an Act "imposing certain duties upon the Commonwealth and political sub-division thereof in connection with public work." Section 29 of the Act provides it shall be "unlawful" for either the Commonwealth or any of its political subdivisions to engage in any construction work involving engineering "unless the plans, specifications and estimates have been approved by, and the construction supervised by, a registered professional engineer." On this question the Court says it is a grave question whether this provision can be held to be merely subordinate to the main thought of regulating the practice of engineering, and whether it does not constitute a third and separate subject of legislation, namely, the regulation of the lawfulness of work, and incidentally of contracts, connected with public improvements.

TENNESSEE

In 1928 a friendly suit was brought by the State Board of Examiners for Architects and Engineers of Tennessee against the "Standard Engineering Company of Nashville," to test the validity of the statute regulating the practice and registration of architects and engineers and to further determine whether the defendants were subject to the provisions of the statute regulating the practice of architecture and engineering in that State. The suit originated in the Chancery Court in which the Chancellor decreed that the particular chapters of said act under discussion are valid and constitutional, and further, that the said defendants, having failed to comply with the act by registration, had no legal right to advertise and hold themselves out by invoices, bills, letterheads, or otherwise as "Engineers." This decree was appealed to the Supreme Court and its opinion is briefly discussed herein.

The defendants, Standard Engineering Company, were licensed plumbers doing business in Nashville, and contended that they did only such work as plumbers ordinarily take. However, they conceded that they had for a number of years been operating under the name of "Standard Engineering Company." It was also conceded by defendants that upon the stationary used by them in their business was printed "Engineers and contractors for Plumbing, Heating and Ventilating Systems and Power Plant Equipment."

Clearly then, says the Court, the business of defendants as conducted falls under the provisions of Section 18 of Chapter 70 of the Acts of 1925, which provides in part:

> "—A person shall be construed to practice (or offer to practice) engineering or architecture who, by verbal claim, sign, advertisement, letterhead, card or in any other way, represents himself to be an architect or engineer, with or without qualifying adjective, or through the use of some other title implies that he is an architect or engineer."

The Court finds that the defendants do by "sign, advertisement, letterhead, card" represent themselves to be engineers and therefore must "be construed to practice, (or offer to practice) engineering." The defendants may not have undertaken to practice engineering and architecture in the strict sense of the word but they have seen proper to advertise themselves as engineers, and this is prohibited by law unless they are in fact engineers.

The Court, in its opinion says that the defendants are not denied the right to continue their business if they continue it under a name not apprehended to mislead the public. Their regular business was that of plumbing and so long as they conducted this business lawfully and under names and advertisements that are not misleading, they could not be molested. However, the legislature has the power to regulate the practice of engineering and architecture and in the interest of public safety, may deny to all, except those qualified, the right to advertise as architects or engineers, and those who invite the confidence of the public upon the theory that they are architects or engineers and may be compelled to submit to such regulations as will protect the public against misapprehension.

The Court goes further and says that by these regulations the defendants are not deprived of their property without due process of law and they are not deprived of their right to continue their business if they continue it under a name not calculated to mislead the public, and in fact they are not even deprived of their trade name, if they qualify to practice as engineers under the statutory provisions.

By this reasoning the Court found that the Chancellor's opinion was correct and that the defendants had no legal right to advertise and hold themselves out to the public as engineers or architects without complying with the statute regulating the practice and registration of engineers and architects.

The defendants further attempt to hold the act unconstitutional on the theory that certain provisions and Sections of the act contains matter not embraced within its caption. Under the constitution of the State of

Tennessee only such matters as are referred to in the caption of an act, either specifically or by clear implication can be embodied within the act itself and unless reference is made in the caption to a provision, the whole act is unconstitutional if it contains subjects or matters not authorized by the caption. The court in this instance found that this objection was without foundation and held that the caption was broad enough to cover all the matters referred to in the Act.

In 1932 another suit was filed in Chancery Court at Nashville, Tennessee, styled:- State Board of Examiners for Architects and Engineers vs. A. Herbert Rogers, to enjoin A. Herbert Rogers from the practice of Architecture or to use the name Architect or Associate Architect or hold himself out as an Architect when not having been registered as such under Sections 7090 to 7112 of the Code of Tennessee regulating the practice or offering to practice Architecture which provides among other things:-

> (a) Who uses the appellation "architect" or an appellation which is a compounding, modifying or qualifying by an adjective of the word "architect" and which gives or is designed to give the impression that the person using it is an architect; or who, by verbal claim, sign, advertisement, letterhead, card, or in any other way represents himself to be an architect, with or without qualifying adjective, or through the use of some other title implying that he is an architect;
>
> (b) Who uses any plans and specifications for and has responsible charge of the design or supervision of any building which involves the public safety or health, and he cannot engage in architectural work as an employee of a registered architect and have responsible charge of the design or supervision of the building, though the plans may be drawn by another.

The defendant, A. Herbert Rogers had a studio in Nashville. He had one room which he used entirely for drawing plans, and was fully equipped for that purpose. Beginning in the year 1929 and continuing up until the time of the complaint was filed, the defendant had signed and issued from his office or studio various plans for buildings as follows:

> "From the Studio of A. Herbert Rogers, Nashville, Tennessee and William L. Dalrymple, Chicago, Illinois," or "From the Studio of William L. Dalrymple, of Chicago and A. Herbert Rogers, Nashville"; or, "From the Office A. Herbert Rogers, Designer, 2410 West End Avenue, Nashville, Tennessee"; or, "A Herbert Rogers, Interior and Exterior Designer, George E. Nevins, William L. Dalrymple, Associate Architects, 816-817 Independent Life Building, Nashville, Tennessee"; or, "From the office of A. Herbert Rogers, 2410 West End Avenue, Nashville, Tennessee."

In 1931 and 1932 the defendant had obtained a license from the County Clerk of Davison County and under Chapter 13 of the Public Act of the Second Extraordinary Session of the General Assembly of Tennessee, for the purpose of licensing himself to prepare and furnish plans and specifications for buildings, sewers, streets, highways, bridges, etc., however, he had not complied with the State law requiring him to be duly registered and to obtain a certificate of registration from the State Board of Examiners for Architects and Engineers.

The proof in the case revealed that William L. Dalrymple, a nonresident whose name appeared on some plans as an Associate Architect, was not a registered architect in his home State of Illinois nor a registered Architect of the State of Tennessee. The defendant, A. Herbert Rogers, had exhibited plans and specifications for various residences in the City of Nashville. In one instance the plans and specifications for a residence were signed "A. Herbert Rogers, Interior and Exterior Designer, George E. Nevins and William L. Dalrymple, Associate Architects." In other instances it was shown that Rogers, the defendant, had complete charge of the plans and specifications by which buildings were constructed after Dalrymple had ceased to have any connection with him, and further, the defendant had prepared plans for a garage without the aid of any of his associates. That he had actual supervision over the preparation and designs of the plans and carried out all the duties which were specified and set out in the construction contract and received compensation therefor. The question before the court was, "Did A. Herbert Rogers intend to represent himself as an Architect or as an Interior and Exterior Designer?"

On this point the court held "that the very use of the term Associate Architect would convey to the public's mind that Rogers was associated with someone else and that as his name on the plans, preceding the name of his associates, could have no other reasonable significance than that they were associate architects with him and that that must have been the intent of the defendant. Otherwise, why use the term 'Associate Architect'?"

The Court goes thoroughly into the question of what acts would constitute the holding one self out and doing the actual thing that an architect does, regardless of whether the term architect was actually used by the party himself and holds "that it isn't what a party claims an Act to be that determines its character, but the Act itself." The proof revealed that the defendant was doing those things that an Architect does and was receiving compensation for it and therefore the question as to whether the defendant was practicing architecture was not fixed and determined by his verbal testimony, or by what his employers thought he was but it was his acts and not his claim that made him liable for registration.

The defendant proclaimed to the public with whom he had dealings that he was not an architect but the record disclosed that he was drawing plans and specifications and entering into contracts under the name of an architect and received compensation for such work that is ordinarily and customarily done by architects, and by the use of the appellations he gave the impression to the public that he was an architect, or through the use of such term implies that he was an architect or representing himself to be such. However, the court says, in the face of this he comes into court insisting that he was not amenable to the registration act.

The Court concluded that the defendant's act constituted practicing architecture in the State of Tennessee, that as he had not received a certificate of registration as provided by law, that in so engaging in such occupation without having certificate of registration, was a public nuisance, that he was abated by the injunction precess and permanently enjoined from practicing architecture in the State of Tennessee until he complied with the law of registration.

This case is now on appeal to the Supreme Court of Tennessee from which we have not yet received a decision.

Your committee has been advised by the State Board of Oregon that one case has been successfully prosecuted in a Circuit Court of that State but due to the fact that the defendant pleaded guilty to the complaint the case was not carried beyond the lower court. The decree of the lower court in this case was not furnished your committee.

The State Board of Wyoming reports one case involving the license law of that state and cites the case of: State vs. Butler, and printed in 40 Wyoming, 404; 278 Pacific Reporter 563. The opinion of the Court, which we understand was a Supreme Court decision, was not furnished your Committee and although we were given specific reference your Committee admits guilt of "latches" in not giving this, the first State in these United States, to enact an Engineering Registration Law, a more prominent mention in this report.

Respectfully submitted,
ROY E. WARDEN, Arkansas,
Chairman.
F. D. WEBER, Oregon.
PAUL DOTY, Minnesota.
N. T. KINZLY, Tennessee.
ROY G. FINCH, New York.

* * *

Engineers Council for Professional Development

(Continued from Page 8)

covering the organization of the E. C. P. D. and its objectives. The Chairman was empowered to complete the selection of the committees.

The third meeting of the Executive Committee was held on March 13, 1933, at the A. S. M. E. headquarters in New York. Eight of the nine members were present, also Karl T. Compton, George T. Seabury, and H. H. Henline (National Secretary A. I. E. E.). After discussing three minor revisions that had been suggested, the Committee voted to refer the Charter to the participating bodies with the recommendation that it be adopted. A copy of the Charter is submitted herewith for ratification by the National Council. R. L. Sackett, Dean, School of Engineering at Pennsylvania State

College, was named to succeed Harrison P. Eddy as Chairman of the Committee on Student Selection and Guidance. Chairman Hirshfeld reported the personnel for the four committees which, with subsequent revision, are now as follows:

Committee on Student Selection and Guidance—R. L. Sackett (Chairman), H. P. Eddy, Harvey N. Davis, Olin J. Ferguson, T. Keith Legaré, Virgil M. Palmer, W. B. Plank.

Committee on Engineering Schools—Karl T. Compton (Chairman), H. A. Curtis, P. H. Daggett, H. P. Hammond, E. P. Mathewson, A. A. Potter, H. S. Rogers.

Committee on Professional Training—R. I. Rees (Chairman), J. C. Arnell, Chas. Derleth, Jr., D. S. Kimball, R. A. Seaton, A. D. Smith, W. B. Updegraff.

Committee on Professional Recognition—C. N. Lauer (Chairman), J. W. Barker, F. M. Becket, F. L. Bishop, H. C. Parmelee, J. P. H. Perry, D. B. Steinman.

Dr. Compton reported that considerable progress had been made in carrying out the function of his Committee on Engineering Schools. A sub committee consisting of Dean Daggett and Professor Hammond is assembling material dealing with the establishment of criteria for engineering schools, this material to be ready for discussion some time during the summer. The Committee is also considering questions of cooperation with engineering schools in the matter of curricula, also some matters dealing with criteria for graduate schools of engineering.

For the Committee on Professional Training, General Rees reported that items under consideration included a survey of the location of young engineers and of educational facilities available; preparation of an informational bulletin; and a survey of local engineering organizations available for the direct assistance of young engineers.

For the Committee on Professional Recognition, research work has been started bringing together information about the three existing standards of professional recognition; membership in engineering societies, professional degrees, and requirements for licensing and registration. This information will be circulated to the members of the Committee as soon as the tabulation of data is completed.

The request of the N. C. S. B. E. E. for cooperation of the E. C. P. D. in the direction of the National Bureau for Registration was referred to the Committee on Professional Recognition.

The N. C. S. B. E. E., is now officially represented in the E. C. P. D. by T. Keith Legaré on the Committee on Student Selection and Guidance, Parker H. Daggett on the Committee on Engineering Schools, and D. B. Steinman on the Executive Committee and the Committee on Professional Recognition.

The past year has been devoted to perfecting the organization of the E. C. P. D. and its committees and formulating a program of procedure. More tangible progress and accomplishment may now be expected.

D. B. Steinman.

Registration Information

(Continued from Page 9)

in connection with any public or private utilities, structures, buildings, machines, equipment, processes, works, or projects, wherein the public welfare, or the safeguarding of life, health, or property is concerned or involved, when such professional service requires the application of engineering principles and data.

The mere execution, as a Contractor, of work designed by a Professional Engineer or the supervision of the construction of such work as a foreman or superintendent shall not be deemed to be active practice in engineering work.

Fees

The charges for services of the Registration Bureau are as follows:

The fee for investigating and verifying the professional record of an engineer is $10.00, which fee must accompany application and will be retained by the Registration Bureau regardless of whether or not the results of the investigation warrant the issuance of a Certificate of Qualification.

When an application for a Certificate of Qualification is approved, the applicant will be so notified by the Bureau and upon payment by him of an additional fee of $5.00 the Bureau will furnish the applicant with a photostatic copy of his verified record and also with a separate Certificate of Qualification suitable for framing.

Additional photostatic copies of verified professional records will be furnished by the Registration Bureau for $3.00 each. These certified copies of professional records may be sent direct by the Registration Bureau to State Boards of Engineering Registration or other parties designated.

An applicant whose status is classified under provision "B" of the requirements for a Certificate of Qualification and who has not passed an engineering examination satisfactory to the Registration Bureau, will be notified to this effect and, if desired by him, the Registration Bureau will appoint an examining board in the State of which applicant is a resident, to conduct the examination in accordance with standards approved by the Registration Bureau, the cost of such examination to be paid by the applicant.

* * *

Revise Economics, Mobilize Incomes, Expedite Recovery

(Continued from Page 10)

By a long and tortuous path, the Federal Government has finally arrived at a conclusion which to the Engineer was obvious through the nation's peregrinations in search of panaceas for the evil of excessive unemployment.

For four years the appeals of millions asking only the right to labor, has been answered by prophecies, predictions, demands for patience, puerile misnamed psychological effusions, tax revisions, moratoriums, budget balancing and credits to everyone but the man who asked only that he be given an opportunity to work.

The one great constructive measure of the past few years is the public works program recently enacted by Congress. It and it alone will assure employment, the inalienable right of every citizen and the sine qua non to the contentment of a nation. Labor not alone produces wealth but is the one unimpeachable means of redistributing concentrated control of human necessities. Overproduction and individual accumulation of the world's goods alike cease to be important when every one has enough.

Personally the speaker believes that the task of providing relief is far too great for private endeavor. The government, rather than individual agencies, should collect and dispense the finances gathered for the purpose of creating employment. In this day and year, a certain moratorium is greatly needed in these United States; one that would abolish a system and a practice unworthy of a nation possessed of untold resources and willing labor and one that would rid the American citizen of an annoyance and burden far greater than that of taxation—Big Business masquerading under the guise of Charity. With the aid of such a moratorium the duty of every American could be imposed by registration of his income and wealth. A percentage, increasing with the amount of one's income, could then be drafted as was human life during the late war. An average of but one dollar a week would today produce over $35,000,000 fifty-two times annually, which could be separated from all other funds and expended on the greatest program of construction that the world has ever known; one that would provide creative work for all; and one that would make of America—the pride of mankind.

The World War demonstrated the feasibility and desirability of drafting the man power of a nation in an hour of need. Surely money cannot be held more sacred than human life. That in an emergency a universal draft of resources is fair, practicable and effective is beyond all question of doubt. The American Legion has made of this policy a cardinal principle.

Times of stress are not necessarily restricted to those of war.

At this very moment the great problem before the nation is the means of financing the public works program.

In substance the plan proposed by the speaker is as follows:

Enroll every wage earner and recipient of an income in the United States.

Ascertain the income of every such person.

Tax every income a specified amount, based on a graded percentage, increasing with the income.

Eliminate all drives by private agencies.

Collect this tax every month.

Compel every person to report to a Draft Board at stated intervals.

Allow no exemptions.

Create a cabinet office to be known as the Department of Public Works.

Place in charge thereof a man comparable in ability to General Pershing and who would, for the period of emergency, have the powers of a General.

Immediately begin such construction as is ready for execution, and prepare for and plan:- the building and maintaining of highways, water ways, power projects, hospitals, schools, sanitariums, libraries, public buildings, bridges, tunnels, river and harbor improvements, the reclamation and irrigation of land, together with countless other projects useful and necessary to the people of the United States.

Continue to draft the incomes and to carry on the projects mentioned until the emergency shall have been concluded and prosperity restored.

Such a program, despite its imperfections, is practicable and is less costly and less difficult of execution than the conduct of a great war. It has many advantages over the uncoordinated efforts that have been the topic of frequent discussion by States, cities and private corporations during the past few years. Also it avoids the difficulty of borrowing money and increasing the national, state and city debts and eliminates the undesirable element wherein those who are possessed of the wealth to lend great sums, reap enormous harvests on safe investments whilst actually making no sacrifice. Under any conditions, borrowed money must be paid by the people in some form of tax. Why not eliminate the middleman and utilize the interest for continued expansion of activity?

This proposal is not offered as a panacea for depressions but it affords a prospect of relief and would prevent sacrifices far greater than merely a percentage of everyone's income. It is offered solely as a suggestion with a view to developing and keeping in circulation the wealth of a nation which has resources far beyond its needs. It lends itself toward the development of a reserve for future emergencies and could be administered through states and municipalities.

In the face of the distress of human beings it is folly to call expenditures that put people to work waste. One is not unmindful of the value of so-called efficiency and of the effects of economy upon taxation. But it is inconceivable that any tax could impose a burden equal to the contribution that every man will be called upon morally to make in order that millions begging leave to earn their bread may continue to exist. Let us hope that in carrying out a program of relief the question of whether it is useless expenditure or waste will not be weighed against the objective of preventing starvation.

Let us cease speculating and predicting and go to work. The so-called optimist and pessimist are equally useless, in fact harmful, in the present crisis. One thinks everything will right itself. The other believes that it is useless to try to right anything. Both produce the same result—Nothing. What is needed is neither optimism nor pessimism, but something that might be called endeavorism; to which should be added a little of that spirit with which the youth of a nation has all too often gone forth to offer the supreme price of mankind. This crisis will pass. It will disappear with the aid of realization, endeavor and sacrifice, and one humbly submits that the sooner the realization and the greater and more nationalized the endeavor—the less will be the sacrifice.

Note: This address was delivered over nationwide circuits in behalf of the American Legion Trade Recovery Campaign before the N. R. A. was effected.

* * *

ENGINEERS CODE DRAFTED

(Continued from Page 12)

governmental agency, who engages the services of a professional Engineer on a salary or wages basis.

A contractor shall be any individual, firm, corporation, or agency contracting to perform the work called for by Engineer's plans and specifications.

In order to establish the position of the Engineer the Committee recommended adding a definition of the Practice of Engineering. The same is in substance that which is recognized now in New York.

Certain important considerations will probably be covered for the time by blanket or general provisions which can be amended. Of vital importance to all Engineers is the question of fees and salaries. It was urged by the Committee that the same be kept on a plane such as to justify approval by all engineering groups.

Before the Code is submitted for Presidential signature an opportunity to review the same will be afforded all engineering organizations. The New York State Society was represented by Past Presidents Steinman and Sheridan. The special Code Committee of the New York County Chapter also participated in the deliberations. Every effort was made to maintain standards and rights which the profession has attained in this State.

Past President Sheridan expressed the view on the morning of the second day that delay in framing a Code would be preferable to inadequate provisions that needs must result from too great haste. The imperativeness for immediate action was stressed by Mr. Proctor, the Chairman, who advised that the Architects' Code was ready for presentation.

The questions of—salaries, right to act as principal for a client, the eventual establishment of territorial advisory groups and the propriety of having recognized professional groups, such as the New York State Society, to present the professional viewpoint and social and economic problems of the calling within a state, must receive careful consideration.

The proposed Code recognizes the leadership of the American Society of Civil Engineers and includes the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the American Society of Chemical Engineers, the American Institute of Mining and Metallurgical Engineers and the American Association of Engineers in its administrative Council.

The establishment of Regional Boards and the question of including sub-professional services are yet to be decided upon.

The American Society of Civil Engineers has taken a real step toward bringing the various national groups under one leadership. Mr. Proctor, as Chairman, merits commendation for his fair, patient and impartial conduct of a hurriedly formed Committee whose deliberations may prove to be of great significance to the engineering profession.

* * *

N. I. R. A. PUBLIC WORKS

(Continued from Page 12)

Region 5—Montana, Idaho, Washington and Oregon; headquarters, Portland; advisor, Dana Marshall of Portland, Ore.

Region 6—California, Nevada, Utah, Arizona; headquarters, San Francisco; advisor, Justus S. Wardell of San Francisco.

Region 7—Texas, Louisiana, New Mexico; headquarters, Fort Worth; advisor, Clifford Jones, Spur, Texas.

Region 8—Colorado, Kansas, Oklahoma, Missouri and Arkansas; headquarters, Kansas City; advisor, Vincent M. Miles, Fort Smith, Ark.

Region 9—Mississippi, Alabama, Georgia, South Carolina, Florida; headquarters, Atlanta; advisor, Monroe Johnson, Marion, S. C.

Region 10 — Tennessee, Kentucky, West Virginia, Maryland, Delaware, Virginia and North Carolina; headquarters, Richmond; advisor, George L. Radcliffe, Baltimore.

In each State an Advisory Board has been created.

For the State of New York such Board is composed of:

Peter G. Ten Eyck, Albany, Business man and Official; John T. Dillon, Buffalo, Banker; Paul M. Mazur, New York City, Banker.

In New Jersey the members of the Board are:

Edward J. Duffy, Teaneck, Business man; William E. White, Red Bank, Public Official; Walter Kidde, Montclair, Retired Engineer.

* * *

TREASURY DEPARTMENT CALLS ON PRIVATE ARCHITECTS AND ENGINEERS TO PARTICIPATE IN NEW BUILDING PROGRAM

(Continued from Page 12)

ably, have had some previous experience in public building work, Mr. Robert has requested the co-operation of American Engineering Council and the American Institute of Architects in enrolling qualified individuals and firms. His purpose is to engage on every building architects and engineers resident in the State in which it will be erected.

The Treasury Department, with the co-operation of the American Institute of Architects, is assembling the records of architects throughout the country. Each known architect has or will receive a prequalification blank, reproduced herewith, which should be forwarded to reach the Treasury Department promptly.

As the procedure adopted for enrolling architects could not be utilized satisfactorily to obtain the same character of information concerning engineers, the American Engineering Council has been requested by Mr. Ro-

bert to compile state lists of engineers and engineering firms that customarily engage in construction of buildings of the monumental character usually typifying those built by the Federal Government.

Through its member-organizations and other technical groups, Council inaugurated its canvass several weeks ago. The lists are being prepared so that Council will be in a position to submit to the Treasury Department the names of competent engineers in any and all states when there is a call for the services which they are qualified to render.

Any qualified engineer desiring to participate in the Treasury Department's building program should send to L. W. Wallace, Executive Secretary, American Engineering Council, 744 Jackson Place, N. W., Washington, D. C., a complete statement, in duplicate, of his professional record, with a citation of significant references.

American Engineering Council's function in enrolling engineers for the building program is to make available lists of competent engineers and firms and not to select and employ men. These are functions of the Treasury Department.

American Engineering Council is gladly co-operating with Assistant Secretary of the Treasury, Mr. Robert, and the American Institute of Architects in making available to private engineers and architects construction work done under the direction of the Supervising Architect's Office.

* * *

NATIONAL COUNCIL OF STATE BOARDS OF ENGINEERING

(Continued from Page 12)

COMMITTEE ON NATIONAL BUREAU OF ENGINEERING REGISTRATION

A National Bureau of Engineering Registration shall be conducted under the direction of the Committee on National Bureau of Engineering Registration. This committee shall consist of five members; three appointed by the incoming President for terms of one, two, and three years, respectively, and at the expiration of these terms one member shall be appointed annually by the incoming president for a term of three years; the Chairman of the Committee on Accredited Engineering Schools; and the Chairman of the Committee on Uniform Examinations for Registration. When the words 'Registration Bureau' are used it shall mean the Committee on National Bureau of Engineering Registration. The Registration Bureau shall be assisted in its work by an Advisory Board of representatives appointed by national engineering societies or associations which may be invited by the Council to participate.

"The Bureau Committee shall adopt forms, rules, regulations, and fees for the Registration Bureau. The Registration Bureau shall investigate and verify the professional records of engineers and issue Certificates of Qualification to engineers who comply with its requirements. The certificates of Qualification shall be issued by the Registration Bureau in the name of the National Council of State Boards of Engineering Examiners and shall be available as evidence of qualification for registration as a professional engineer with State Boards of Registration, for Registration, for membership in national and state engineering societies, in connection with the award of professional degrees by engineering schools, for presentation to clients when soliciting contracts for professional services, for presentation to employers when applying for positions, and for similar purposes.

"Whenever legally possible and in the absence of disqualifying evidence, Member Boards are expected to give due consideration to, recognize, or accept as competent evidence of qualification, the Certificates of Qualification when submitted in support of applications for registration, or as reciprocal endorsement when submitted by applicants who are registrated with some other Member Board, or as the equivalent of reciprocal registration certificates or cards issued by Member Boards, or as prima facie evidence of qualification in lieu of examinations.

"The Executive Secretary of the Council shall be ex-officio Executive Secretary of the Registration Bureau and the payment of his salary from the general fund shall include his services for the Registration Bureau.

"The Bureau Committee shall submit a report to the Annual Meeting of the Council, summarizing the activities of the Registration Bureau and including a complete financial statement of receipts and disbursements."

* * * * *

Below is appended the annual report of the Secretary.

REPORT OF THE SECRETARY
OCTOBER 1, 1932 TO JUNE 30, 1933

During the past year several thousand registered engineers were unable to renew their registration because of unemployment However, the total number of registrants in good standing at this time in the twenty-five states which are members of the National Council is 31,533.

At the 1930 Convention of the Council the Michigan Board presented a written protest regarding the qualifications of some engineers to whom certificates of reciprocal registration had been issued by certain States in the name of the Council, this protest resulting in a discussion of this system of reciprocity and suggestions for a new method. The Council subsequently provided for a system of reciprocity in connection with the operation of the Registration Bureau, but much confusion has been caused by the continuation of the old system of reciprocity cards by some States. A total of only 663 reciprocity cards, many of which were never used, have been issued by State Boards during the period of ten years that the Articles of Agreement on Reciprocity have been in force. Those Member Boards which have officially announced that they are not issuing these reciprocity cards represent 74% of the total number of registrated engineers in the twenty-five States, Members of Council.

The Secretary's office has been in communication with engineering committees and societies in fifteen states where new registration laws are pending, furnished data pertaining to registration and reviewed proposed Acts. These States are as follows: Connecticut, Ohio, Illinois, Missouri, District of Columbia, Maine, Oklahoma, Nebraska, New Mexico, Delaware, New Hampshire, Alabama, Maryland, Georgia and Utah. It is significant that the Model Registration Law, which was sponsored by the Council, has been used in practically all these States as a basis for proposed legislation. Some letters from those promoting registration laws in these States accompany this report.

In a letter dated March 19, 1921 from the first President of the Council, a member of the Louisiana Board, to the first Secretary of the Council, a member of the Iowa Board, it is stated that " . . . . it seems to me that if we are going to make progress towards the goal we all have in mind, which is uniform examination and uniform registration, that it must be done through the agency of the Council," therefore, it is evident that the activities of the Council, such as Model Registration Law, Uniform Examinations for Registration, Accredited Engineering Schools, National Bureau of Engineering Registration, and Engineers' Council for Professional Development, are not only in full accord with the purpose of the Council as set forth in the Constitution, but are also progressive steps toward attainment of the goal visualized by its founders. The time has come when national engineering organizations are no longer assuming the attitude of the ostrich but are working together for the general welfare of the engineering profession.

On May 15, 1933 the Secretary addressed a communication to all members of State Boards calling attention to and recommending certain activities of the Council, therefore, these matters will not be referred to in this report.

Respectfully submitted,
T. Keith Legaré
Secretary

Note: The Editor acknowledges the courtesy and co-operation of the National Council, especially that of its able Executive Secretary, T. Keith Legaré who furnished the above reports.

* * *

ENGINEERS ON THE ECONOMIC FRONT

(Continued from Page 12)

though daily communiques from the battlefield are growing more and more encouraging. Lasting success asks the engineer and the politican to join hands against waste and ignorance.

In the past, politics and engineering have not mixed. Neither spoke the other's language. Politics viewed the engineer as a technician with little comprehension of how to appeal to human interest, and engineering regarded the politician as the incarnation of expedience and self-seeking. It is no longer necessary to take sides in this old controversy. Events have demonstrated the need for cooperation.

Legislative foundation has been laid in the United States, at least for a program of public works and industrial control of exceptional magnitude. The engineer will of course be on his own ground in the carrying out of these works, and they could not be

performed without his aid. He will have a hand also in the modernization of industry, now about to begin on a considerable scale. The engineer's long suit is the economical design, construction and operation of technical enterprises. His highest value in the times ahead, however, rests in the willingness of the politicians to make fullest use of his fact-finding and analytical abilities and give due weight to the engineering viewpoint in approaching the large problems associated with road-building, forestry, river control and industrial coordination. The engineering approach is available as a direct route toward the efficient utilization of governmental and private resources for the common good, and politicians who heed it reveal true statesmanship.

Enormous sums will be saved and appropriations made most effective if governmental executives will back up the engineers in their attacks on waste where it occurs or threatens. The heaviest burdens of taxation may thus be subjected to some degree of control and relief. It will take high political courage to put the brakes on public expenditures which mature study shows to be excessive or unfairly competitive with business, but it can be done if the Administration adheres to its announced intention of not making the same mistake twice. The American people do not desire the recovery program to degenerate into an orgy of waste under the excuse of a great experiment in paternalism. The times demand the frankest possible facing of costs.

In the years to come applied science unquestionably will achieve triumphs comparable to many of the great accomplishments of the recent past. These fabrics, however, will be shot through with the black thread of cost economy rather than the re thread of waste. The reason is simple and challenging. Humanity, in the long, run, wherever situated, seeks to avail itself of the blessings of progress. Because a low standard of living is out of harmony with human brotherhood, the engineer and the statesman have their work cut out for them for generations to come. What may not be built on such a foundation.

* * *

New Jersey News and Activities

(Continued from Page 15)

ended, with relief to all, in a tie score.

The Chapter will sponsor another party at the Passaic County Course on August 19th at 3:00 P. M. In addition to golf there will be a baseball game and a horse shoe pitching contest. Immediately following the sporting events a hot dog roast, to be held in the woods adjacent to the golf course, will occupy the attention of those present.

A cordial invitation to members of other Chapters is herewith extended.

New York News and Activities

(Continued from Page 14)

the offices of Commissioner of Public Works, Deputy Commissioner of Public Works, Superintendent of Highways and Sewers be filled by Professional Engineers and that Professional Engineers be appointed on Zoning Commissions, Boards of Appeals, Bridge Authorities and Building Commissions have been made by three (3) Chapters.

An endeavor to promote co-operation between the Civil, Mechanical and Electrical branches of the profession in civic activities is being made by one (1) Chapter.

An effort to enlist the interest of Engineering under-graduates and recent graduates in the work of the New York State Society is being made by one (1) Chapter.

The co-operation of public officials, Bar—and other associations, in securing observance of the Engineers' License Laws has been invited by four (4) Chapters.

Campaigns to prevent the misuse of the term "Engineer" are being carried on by three (3) Chapters.

All Professional Engineers regardless of the date of their licenses are being urged by one (1) Chapter to register in the office of the County Clerk.

Schedules of minimum charges for Surveying and Engineering Services have been adopted by two (2) Chapters.

Codes of Ethics and Practice have been adopted by three (3) Chapters.

An endeavor is being made by a Chapter to secure recognition of the services of Engineers by designating important works by the names of the Engineers who were responsible for their creation.

A huge meeting was held under the sponsorship of one of the Chapters at which the subject of "Technology and Social Change" was authoritatively discussed.

Formal approval of the action of the Mayor of the City of New York in appointing two Professional Engineers (Rear Admiral Frederic R. Harris and Arthur S. Tuttle) on the Public Welfare Board of the City of New York, was given by two (2) Chapters.

The Chapters generally throughout the State admirably supported the recent legislative campaign of the State Society.

It can be stated without exaggeration that the present general activities of the Chapters, in advancing the aims and purposes of the Society have never been equalled in the history of the organization.

The Committee on Chapter Activities cordially acknowledges the generous cooperation of the officers and members of the Chapters throughout the State.

Respectfully submitted,

RAPHAEL J. SMYTH, Chairman.

Chapter News

RAPHAEL J. SMYTH

Chairman of Committee on Chapter Activities

USTER COUNTY

A meeting of the Ulster County Chapter was held at McCabe's Restaurant, Kingston, on June 29th. Mr. Arnold G. Chapman, President of the Society and Chief Engineer of Albany Port District Commission, Mr. Oscar A. D'Lubosch and Mr. W. A. Schuerman, President and Secreetary-Treasurer, respectively, of the Dutchess County Chapter, and Mrs. R. F. Wilcoxson of the U. S. Geological Service were among the attending guests. The members and guests fortified themselves with an excellent beefsteak dinner and then proceeded to attack the business of the meeting with as much gusto as they did the viands.

Mr. Chapman recounted most interestingly the progress which has been made in establishing licensing laws for Engineers in the various States. He described the remarkable development of the State Society during its short existence, stressing particularly the increasingly important role which is being played by the Chapters in the drama of community life.

Motion pictures were shown, through the courtesy of Mr. Wilcoxson, of the progressive field and office steps which are taken in the preparation of the maps of the U. S. Geological Survey. The pictorial record of the dramatic incidents connected with a 450 mile survey of the Colorado River, depicting the dangers encountered and difficulties overcome in the chasms and rapids of the Grand Canyon proved of thrilling interest.

Under the energetic leadership of Mr. G. Wallace Codwise, President of the Chapter, the work of recruiting the membership of the Chapter is being carried on with missionary zeal, not only in Ulster but also in the adjacent territory of Greene, Sullivan and Schoharie Counties.

Acknowledgment is made of the courtesy of Mr. Edward P. Ward, Secretary-Treasurer of the Chapter, in transmitting the matter contained in this report.

* * *

ROCKLAND COUNTY

The Board of Directors of the Rockland County Chapter held a meeting in New City on July 12th. The following Directors were present: Mr. C. S. Conover, Pearl River, President of the Chapter; Mr. Calvin T. Allison, Stony Point; Mr. A. B. Chester, Tompkins Cove; Mr. F. G. Davidson, Nyack; Mr. A. Grunewald, Suffern; Mr. W. W. Reynolds, Nyack; Mr. D. M. Salls, Nyack; Mr. Joseph Shankey, West Haverstraw; Mr. Francis Wright, Pearl River.

The following architects were present at the invitation of the Board of Directors: Mr. John J. Cooke, South Nyack; Mr. H. G. Emery, South Nyack; Mr. A. Durant Sneden, Spring Valley.

At this meeting plans were formulated for vigorous cooperative action between Professional Engineers and Architects in an endeavor to establish a Building Code for the County.

STEUBEN AREA

The last regular meeting of the Steuben Area Chapter, which was held at Denison Park, Corning, on July 11th, comprised an inspection trip, a banquet and a business session. The attendance numbered upwards of sixty (60) including the following distinguished guests: Mayor Alfred G. Hood, Corning; Mayor Glen Sweet, Elmira; Andrew B. Maltby, James P. Hallahan, Roy B. Lapp, Commissioners of Public Works, Corning; Commissioner A. D. Eiliott, Elmira; John W. McCarty, Fire Chief, Corning; John H. Doherty, General Manager of the Associated Glass and Electric Co., Corning.

In the afternoon an inspection trip was made to the Corning Glass Works where an unusually large telescope lens in process of manufacture was the center of interest. The visitors then made an inspection of the Fall Brook Division Tube Plant, following which a visit was made to Denison Park where the group photograph was taken which is reproduced below.

At the business session, which followed a most enjoyable banquet, an address was delivered by Dr. John C. Hostetter, President of the American Ceramic Society. The subject was "Engineering and the Glass Industry" which had been discussed in part by Drfi Hostetter before the American Ceramic Society during the previous week at the Century of Progress Exposition at Chicago.

Glass is so commonplace an article of familiar use that it is regarded in a matter-of-fact manner. And yet common and generally unappreciated as it is, it contributes more to the comfort and happiness of men than all of the costliest gems that the mines of the world produce. Built into the walls of human habitations it admits God's sunlight into their recesses. It encloses and protects the incandescent filaments which light, through the night, our buildings, roads and cities. In the form of utensils of various uses it plays an important part in the domestic life of all peoples. Of it have been made the lenses of miscroscopes and telescopes, by means of which the marvels of the entomological and biological worlds have been discovered; the hidden secrets of the mineral kingdom revealed; and the vastnesses of the heavens explored. And through its exquisite mosaics in the famous windows of the cathedrals of the world stream iridescent beams of light of such beauty and brilliance as to give to beholders, with imagination's aid, a foresight of the effulgence of paradise.

Dr. Hostetter referred to natural glass produced under volcanic influences in the forms of vitreous lava, or obsidian, but discussed particularly glass in its commercial forms as artificial compounds of ingredients melted together at very high temperatures. He outlined the improvements made in methods of production from the time glass was made entirely by hand labor to the present time when the most scientific mechanical processes are in use. He described the following three general types of glass produced for commercial use: Lime-soda-glass for use in ordinary window glass, bottles and similar articles of common use; Lead-bearing-glass in which lead oxide is used as an ingredient where brilliant lustre and transparency is desired as in table glassware, electric tubes, etc.; Heat-resisting-glass (commonly known as Pyrex ovenware) used in the manufacture of insulators capable of resisting high voltages, accessories for chemical laboratories, and apparatus for scientific research work. Dr. Hostetter's most interesting and informative address, illustrated by lantern slides, was concluded with a tribute of high praise for the accomplishments of the Engineering profession in the industrial field.

The Chapter acknowledges its indebtedness to Mr. Herman F. Eilers, Engineer of the Corning Glass Works, who had charge of the arrangements for the inspection trips.

The meeting was a notable success from every viewpoint. One item of special interest was the admission of six new applicants to membership in the Chapter. The next Chapter meeting will be held at Hornell on September 5th and a cordial invitation is extended to all professional Engineers in the Steuben Area to attend.

Mr. William O. Drake, President of the Chapter, in his report upon the meeting, observes "You will note that the Steuben Chapter is forging ahead." Mr. Drake can be assured that the progress of the Steuben Area Chapter is being followed with lively interest, and cordial congratulations are extended to the officers and members of the Chapter for their enterprise and intiative.

* * *

WESTCHESTER COUNTY

Mr. John Avery, President of the Westchester County Chapter, has courteously transmitted the information contained in the following account of recent Chapter Activities in the County.

Immediately upon the enactment into law of the National Recovery Bill the following committee was appointed by the President of the Chapter to make necessary studies and arrangements to secure for the County such advantages as are possible under the Act: Mr. John Avery, Yonkers; Mr. James M. Duffy, Mamaroneck; Mr. Ben H. Krey, Bronxville; Mr. Eric Andrews, White Plains; Mr. A. M. Anderson, White Plains.

In accordance with the arrangements made by the committee preliminary meetings have recently been held by representatives of civic, professional and trade associations, for the purpose of forming an Industrial Recovery Act Construction League to adopt a fair-practice code governing all phases of construction work in Westchester County under the provisions of the Recovery Act.

The groups represented at the preliminary meetings were: The Westchester County Chapter of Professional Engineers, The Associated General Contractors of Westchester, The Westchester Building Trades Council, The Building Trades Employers' Association of Westchester, The Westchester County Federation of Labor. The Westchester County Societies of Architects and Civil Engineers, The Westchester County Plumbers' and Steamfitters' Association, The Westchester Electrical Association, and The Westchester County Highway and General Contractors' Association.

Mr. Raymond De Mott, Chairman of the delegation representing the Westchester County Chapter has been elected temporary Chairman of the League pending the appointment of full delegations by all affiliated organizations.

An open public meeting is being

MEMBERS AND GUESTS OF STEUBEN AREA CHAPTER : DENISON PARK : JULY 14th, 1933

arranged to be held in the near future at the County Center, or other suitable auditorium, to which outstanding figures in our national public life will be invited to discuss the Recovery Act and its application to conditions existing in the County.

* * *

ORANGE COUNTY

The Orange County Chapter, in conjunction with the Dutchess, Rockland and Ulster County Chapters, held a "Get Together" outing at Kristic's Place near Rosendale, Ulster County, on Saturday afternoon, July 29th.

Information was given, in the notice of the outing, of interesting Engineering works which are in progress in the vicinity of the meeting in order that the more ambitious, by making inspections on the wing" during their journey to the rendezvous, might combine business with pleasure.

The facilities offered for tennis, bowling and swimming were taken full advantage of and an excellent dinner was served in the evening.

It is anticipated that the report of the outing, which was received through the courtesy of Mr. H. L. Felch, Secretary of the Chapter, will be supplemented by a more detailed account in the September issue of the magazine.

* * *

NEW YORK COUNTY

Information has been received through the courtesy of Mr. H. G. Balcom, President of the New York County Chapter, that the Special Committee on Engineering Fees and Salaries, under the Chairmanship of Dr. Ralph McKee, head of the Chemical Department of Columbia University, is hard at work on the task assigned to it. This Committee is being aided by sub-committees who are studying particular phases of the problem. The membership of the main committee is as follows: Dr. Ralph McKee, Chairman; Mr. Maurice Goodman, Mr. J. L. Holst, Mr. R. A. Pendergrass, Mr. John W. Pickworth. It is expected that a report will be submitted to the Chapter in the early Fall.

A committee has also been appointed to assist the United Front Committee under the Chairmanship of Dr. D. B. Steinman.

Recently the names of the following new members were enrolled on the membership roster of the Chapter: Mr. Harry S. Arnold; Mr. Victor J. Cucci; Mr. Edwin A. Kingsley.

BRONX COUNTY

On September 17th, in Pelham Bay Park, a magnificent monument will be dedicated in honor of the 947 gallant sons of The Bronx who laid down their lives during the World War on the altar of devotion to their country's patriotic and humanitarian ideals. The monument consists of a great granite shaft set in a formal garden over-looking a grove of 947 Linden Trees set in serried ranks—a regiment of living sentinels keeping unceasing vigil over the memories of those who lie in Flander's Fields where "the poppies grow, between the crosses row on row" that mark their final resting place.

The dedicatory ceremonies will be most impressive, with high dignitaries of church and state officiating, and organizations from all parts of New York and neighboring states participating. Of the several committees, one—that charged with the erection of temporary structures, seating arrangements, radio broadcasting and amplification services, of which Arthur V. Sheridan, Past President of the Bronx Rotary Club, is Chairman, lists many of the outstanding Engineers of the County, headed by Major General Elmore F. Austin, Chief Engineer of The Bronx, and includes Walter A. Addicks, Josiah A. Briggs, Leo C. A. Burrows, Leo J. Ehrhart, Capt. William J. Husson, Alexander Haring, John H. Knight, Joseph F. Lamb, Charles J. Schaefer, Raphael J. Smyth, Paul Treutler, Raymond J. Van Wagner.

* * *

CHATAUQUA-CATTARAUGUS COUNTIES

A new Chapter has been formed—The Chautaqua-Cattaraugus Counties Chapter. This constitutes the latest milestone erected on the road of progress which is being constructed by the New York State Society of Professional Engineers.

The story of its organization is related by Mr. R. B. Lyon, Secretary-Treasurer:

On March 13th, Mr. Fred H. Zurmuhlen, the enthusiastic and untiring Chairman of the Membership Committee of the New York State Society, communicated with the 47 licensed Engineers and Surveyors in the two counties inviting them to cooperate in the work of forming a new Chapter. The replies indicating that a Chapter might be successfully organized, Mr. Zurmuhlen arranged for a meeting which was held at the Hotel Jamestown, in Jamestown, on May 10th, and which was attended by eight Engineers. At this meeting it was unanimously decided to organize a Chapter and the following temporary officers were chosen: Mr. Walter F. Shaw, Chairman; Mr. C. Eugene Bentley, Secretary.

On May 24th a second meeting was held in the City Engineers' Office at Salamanca at which the following officers and directors were elected: Mr. Walter F. Shaw, Jamestown, President; Mr. George L. Purdy, Olean, Vice-President; Mr. Richard B. Lyon, Olean, Secretary-Treasurer; Directors for two years, Mr. A. C. Walter of Dunkirk, and Mr. Walter J. O'Brien of Randolph; Directors for one year, Mr. M. H. Regan of Salamanca, and Mr. Eugene Bentley of Jamestown. A Committee on Constitution and By-Laws composed as follows, was appointed: Mr. Gilbert R. Miles of Olean, Mr. Walter E. Wanner of Olean, Mr. John M. Hackett, of Dunkirk, and Mr. E. H. Keyes of Forestville.

On July 12th a meeting was held at Dunkirk at the office of Mr. A. G. Walter, City Engineer, at which a Constitution and By-Laws were adopted. The members were conducted on a tour through the City and along its beautiful water front prior to the meeting, and at the conclusion of the business session they adjourned to the Rod and Gun Club on the shore of Lake Erie where activities of a more social nature were engaged in.

The next meeting will be held in Jamestown on August 9th.

A most cordial welcome into the cofraternity of New York State Chapters is extended to the Chautaqua-Cattaraugus Counties Chapter. May its organization and activities prove highly beneficial to its members and to the profession.

* * *

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MINIMUM SALARIES OF ENGINEERS

American Society of Civil Engineers Makes Recommendations

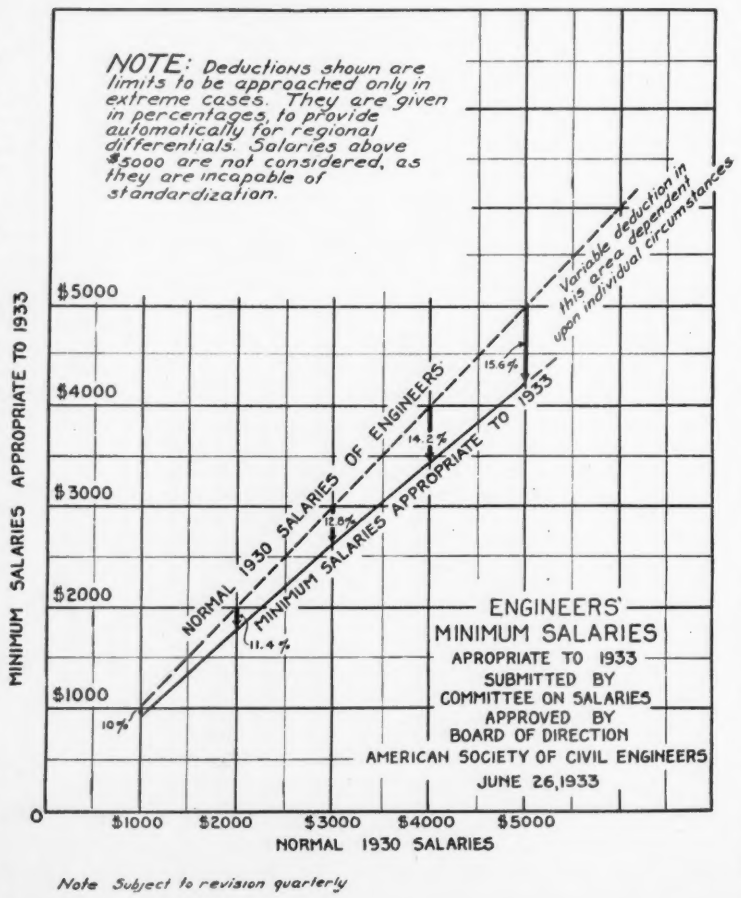
Report and Chart Applicable to 1933

An interesting report of the Committee on Salaries of the American Society of Civil Engineers was made public at the recent convention held in Chicago.

The report, together with the accompanying chart, should be carefully studied rather than glanced at. No attempt is therein made to set up appropriate compensation. The recommendations merely set maximum reductions based on compensations prevailing in 1930. The report is as follows:

The matter of salary reductions during the depression is vital to all engineers, whether as employers or employees. Reduction has been quite universal all over the country, but neither in uniform manner nor uniform amount.

On the other hand, it is observed that the suffering resulting from unemployment is now contributing to a movement of large proportions in which men, even of high training, are offering themselves at almost any price. It is believed that the Board of Direction of the Society should assume the obligation of establishing a defensible minimum wage scale in behalf of members of the profession. Accordingly the attached chart has been prepared showing a determination of minimum salaries, which in the light of the very considerable mass of data accumulated by the committee in the past several years can be considered as appropriate at this time.


NOTE: Deductions shown are limits to be approached only in extreme cases. They are given in percentages, to provide automatically for regional differentials. Salaries above $5000 are not considered, as they are incapable of standardization.
Variable deduction in this area dependent upon individual circumstances
MINIMUM SALARIES APPROPRIATE TO 1933
$5000
$4000
$3000
$2000
$1000
0
NORMAL 1930 SALARIES OF ENGINEERS
MINIMUM SALARIES APPROPRIATE TO 1933
15.6%
14.2%
12.8%
11.4%
10%
ENGINEERS' MINIMUM SALARIES APROPRIATE TO 1933 SUBMITTED BY COMMITTEE ON SALARIES APPROVED BY BOARD OF DIRECTION AMERICAN SOCIETY OF CIVIL ENGINEERS JUNE 26,1933
$1000 $2000 $3000 $4000 $5000
NORMAL 1930 SALARIES

Note Subject to revision quarterly

The minimum salaries shown are subject to revision quarterly to meet changing living costs and other factors. The working conditions which should now be promulgated should be based on pre-depression normal hours, normal number of days per week, and normal vacation schedules, and should not countenance abnormal furloughs, abnormal contingent agreements and all other devices intended to postpone a return to normal working conditions, pay rates and methods.

It will be noted that no suggestion is made beyond $5,000. This is for the reason that salaries above this point are dependent upon a consideration of the size or importance or complexity of the job upon the special qualifications and capacity of the man. Also, the number of men receiving salaries greater than $5,000 is not great in comparison with the total number of civil engineers. For all of these reasons, such salaries cannot safely be placed in any standardized category.

On the other hand, salaries below the $5,000 figures are those which apply to probably 90 or 95 percent of the civil engineers in the country.

The effort to support salaries of civil engineers is expressed in terms of percentage reductions from the salaries which were paid in 1930, and therefore automatically takes care of regional differentials in cost of living and other conditions of employment which obtain in common with all citizens resident in those respective regions.

The adoption by the Board of Direction of the recommended scale of permissible minimum salaries will help materially to prevent a wholesale destruction of the economic value of the technical services of at least the civil engineering portion of the engineering profession.

For the Committee:

E. P. GOODRICH, Chairman,
Committee on Salaries.

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A SINGLE SOURCE OF SUPPLY FOR ALL WIRING MATERIALS

G-E WIRING DEVICES
G-E GLYPTAL COATED CONDUIT
G-E CODE WIRE AND CABLE
G-E FIBERDUCT

Specify these wiring materials for every type of construction requirement. One source of supply saves time and money. The G-E name assures maximum performance. You are invited to consult with General Electric regarding the use of these materials.

For further information, write Section G-558, Merchandise Department, General Electric Company, Bridgeport, Connecticut.

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MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

AMERICAN AIR FILTERS

Standard wherever there's AIR to be Cleaned

American Air Filters are made by the world's largest manufacturers of air cleaning equipment in a wide variety of types adaptable to every commercial and industrial use.

Our research staff is at your disposal—without cost or obligation—to assist you in working out your engineering problems that apply to the cleaning of air.

American Air Filter Co., *Inc.*
235 Central Avenue, Louisville, Kentucky
In Canada, MIDWEST CANADA LTD., Montreal, P. Q.

Outstanding Buildings Prove the Economy Of

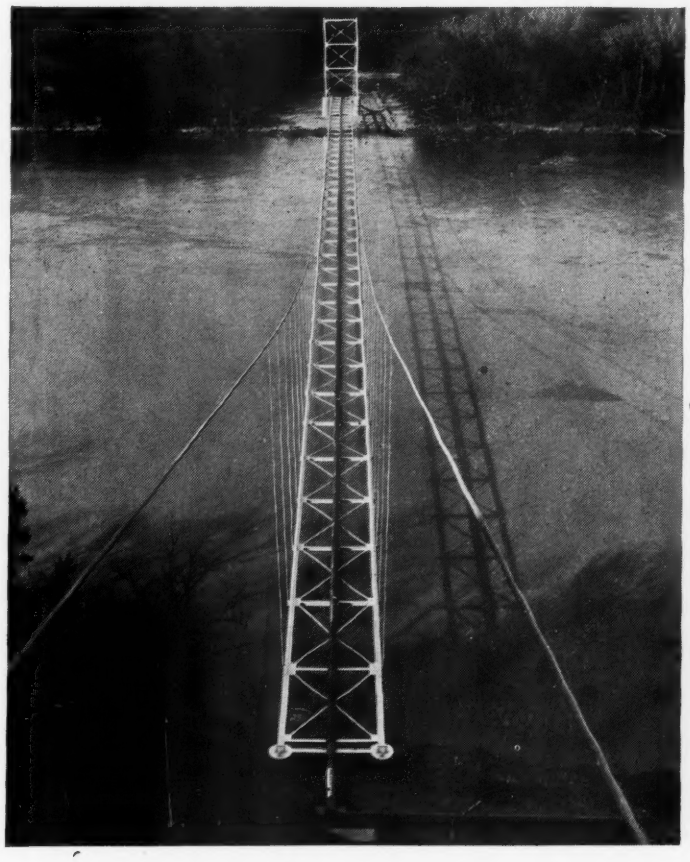
EVANS
Elevator Cable Equalizers

Sheave maintenance and cables represent 75 per cent of the total cost of elevator maintenance.

Evans Equalizers automatically distribute the load evenly over all cables, so that every cable and every sheave groove gets the same amount of wear. Impartial tests by building managers, engineers and other authorities prove these points. Under actual usage greater cable mileage is shown and definite savings are made.

These are facts—they deserve the immediate and earnest consideration of every engineer and executive wishing to reduce operating expense.

Evans Elevator Equalizer Co.
70 E. 45th St., New York. Plant: Bedford, Ind.
Branch: Chicago, Illinois.



ROEBLING PRESTRESSED PARALLEL STRAND BRIDGE CABLE

This recently erected oil pipe line bridge spans the Platte River, near Freemont, Neb. Main Span—1000 feet.

Main Cables: two, each composed of seven 1½ inch Roebling Prestressed Paralled Strand Cables.

Designing Engineers: Mathews and Kenan, San Antonio, Texas.

General Contractors: Pittsburgh-Des Moines Steel Company.

JOHN A. ROEBLING'S SONS COMPANY

TRENTON, N. J.

THE CORE JOINT CONCRETE PIPE COMPANY

Plain and Reinforced Concrete Pipe

For All Specifications

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Autumn Visit To New York!

When you come to the "first city of the world" for business or pleasure—or both, be sure to enjoy the added pleasure of living in the new, smart center of New York . . . at the modern Hotel Montclair. The Montclair is adjacent to all the railroad and important bus terminals, the better shops and the glamorous theatrical district. It offers you every comfort at rates that are surprisingly moderate.

800 ROOMS . . . EACH WITH BATH, SHOWER, RADIO

SINGLE from $2.50 to $5.00 per day
Weekly from $15.00

DOUBLE from $3.50 to $6.00 per day
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Lexington Avenue at 49th Street, N. Y. C.

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"to measure is to economize"

Flow Meters — Potentiometers
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Indicating, Recording, Controlling, Signalling

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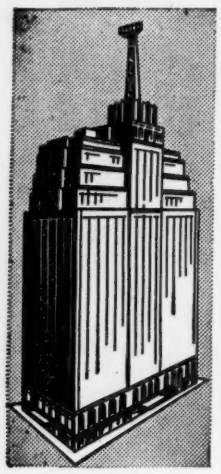
Offices in 22 Principal Cities.

IN THE HEART OF NEW YORK

TO STAY AT THE LINCOLN . . . IS A HAPPY REMEMBRANCE



An interesting cosmopolitan atmosphere . . Cheerful Rooms . . Pleasant Service . . Fine Restaurant . . Moderately Priced . . Around the corner are theatres, clubs and glamorous Times Square . .

Conveniently accessible to railroad terminals, steamship piers, the business and shopping centers . .

"A Perfect Hotel for The Visitor"

ROOM *with* PRIVATE BATH, RADIO *and* SERVIDOR

$3 *single per day* $4 *double per day*

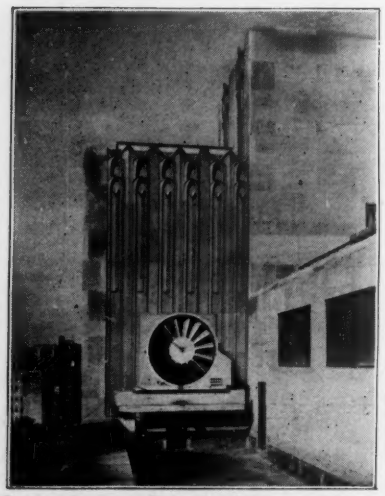
Special weekly and monthly rates.

HOTEL LINCOLN

JOHN T. WEST, *Manager*

44th to 45th Sts.—8th Ave.—New York

UNDER NEW MANAGEMENT "A RELIANCE HOTEL"



One of our forced draft cooling towers on Building No. 8, Rockefeller Center, New York City.

COOLING TOWERS
and
SPRAY PONDS

Designed
Manufactured
Erected

THE
COOLING TOWER
COMPANY, Inc.
15 JOHN STREET
NEW YORK

HE'S FINISHED HIGH SCHOOL

WHAT WILL YOUR SON DO NOW?

We're talking to parents, especially those who, regardless of present circumstances, had made no serious plans for their sons going to college after high school graduation. What we have to say will also interest parents who made plans but have seen them shattered by unforseen forces.

There was a time when a boy could step from high school graduation into a job. The boy who does it today is fortunate indeed. The inability to do it is not always a reflection on his ambition or his ability. In many cases the job is not there.

The economic horizon is brightening—there's no doubt about that—but there are millions of trained men, with families dependent upon them, waiting to fill jobs as they materialize.

At the moment it's a serious outlook—and a sad one for the boy. He is willing to work but cannot find work to do. He is at the peak of his energy and his enthusiasm. Shall he begin life in bitterness, or in brooding over his fate, or make associates and acquire habits that would have never tempted him in normal times?

Your greatest responsibility to that boy is TODAY! He needs your advice and your guidance more than he ever needed it before.

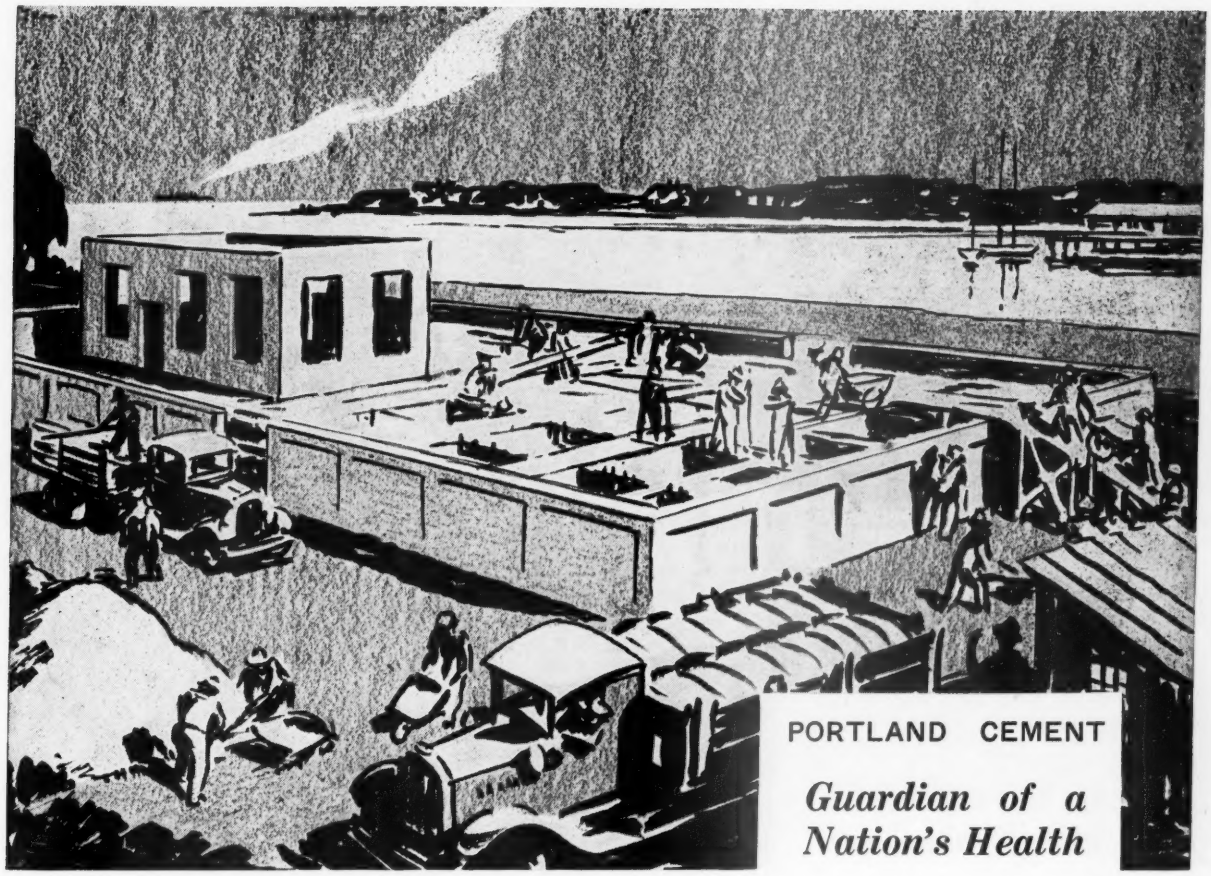
Why not, then, encourage him to devote a systematic portion of his spare time to the study of something which will engage his thoughts and—more important—give him training which will be of inestimable benefit to him in the years ahead?

The International Correspondence Schools, the largest and oldest institution of its kind in the world, have been providing ambitious men with the training they needed for over forty years. In almost every field of human endeavor you will find leaders who attribute their success to I. C. S. training. The boy just out of high school is ideally prepared for study of any of our 300 courses. If you'd like, one of our vocational counsellors will discuss—*personally*—your boy's problem with you and him.

INTERNATIONAL CORRESPONDENCE SCHOOLS

SCRANTON, PA.

Build It Now!



A SEWAGE DISPOSAL PLANT Will Provide Jobs for Home Labor *Trade for Home Stores* —

This is a message which engineers should pass on to cities that are now dumping raw sewage into streams and onto beaches.

Engineers know this practice will have to be stopped eventually, also that the cost of the necessary treatment plants may never be less than it is now. Many states have new laws providing practical methods of servicing the cost; the National Industrial Recovery Act offers possibilities of immediate aid in financing.

BUT: The idea has to be "sold" to the people. They won't always "buy" even if they need a treatment plant desperately—unless the "selling" talk appeals to them.

That's why we point out that the construction will mean JOBS FOR HOME LABOR. Much of the work can be done in winter months, when employment is hard to find.

Use these facts to develop engineering business for your office! Act NOW! We can help you with information—sent on request, free.

PORTLAND CEMENT ASSOCIATION
347 Madison Avenue, New York, N. Y.

Less than a generation ago, the spectre of typhoid hovered darkly above every community. Sanitation was a matter of every city for itself, and let the devil take the fellow downstream. Rivers ran foul with filth as growing cities added daily to the sewage poured into our streams.

Then came the sewage disposal plant —to transform, through the miracle of bio-chemistry, foul sewage into harmless waste. Cement is the tool of the engineer as the basic ingredient in the concrete structures which form the keystone of sewage treatment.

* * *

For Further Information
Write the
Portland Cement Association

85 to 90% of the money spent on Concrete Construction Goes to Labor

Inside this Cabinet are 27 Copper Chimneys

. . . and thereby hangs our tale of . . .

DUCT STANDARD MODEL

This radiator is 27″ long; 23″ high and 7″ wide. Weighing only 42 lbs., it is easily portable.
Operates on 110-115 Volt A. C. or D. C. circuits. Using 600 Watts on "Low" and 1200 Watts on "High," it may be plugged into ordinary convenience outlets.
Finished in mahogany or jade green.

Prices:—

$32.50
(Equipped with Manual Control).

$53.50
(With Thermostatic Control attached).

"ECONOMICAL ELECTRIC HEATING"

There is no denying the convenience, flexibility and low installation cost of Electric Heat. High Operating Cost has been the bugaboo.

A Formula of Physics tells us point blank that a given amount of Electricity converts into so many B. T. U.'s—no more—no less. Common sense, however, suggests that the Effectiveness of an Air Heater depends not only on the quantity of B. T. U.'s generated but also, to a great degree, on the way in which the generated heat is discharged from the heater and distributed throughout the room.

From years of thought and experimentation to materially increase Heating Effectiveness through more efficient Discharge and Distribution came our DUCT ELECTRIC RADIATOR.

Externally it is a graceful and finely finished piece of furniture. Inside, you find an interesting, utterly simple Chassis, embodying 36 sq. ft. of copper heating surface arranged in multiple-flue formation—the patented "DUCT PRINCIPLE"

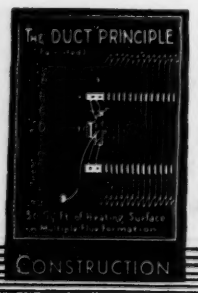
The sketches and descriptions below detail DUCT'S construction and operation. There are no fans or blowers—no moving parts at all, in fact, to require servicing or make a noise. The enormity of our heating surface plus the strong "flue action" of its patented arrangement accounts for DUCT'S amazing Effectiveness and consequent Economy.

A DUCT RADIATOR, using only 600 Watts, discharges the air at about 120°F; whereas an identic "ductless" heater, using 1200 Watts, discharges the air at only 130°. Our DUCT RADIATOR, switched up to 1200 Watts, discharges the air at 160°. This striking comparative demonstration is made daily at our offices.

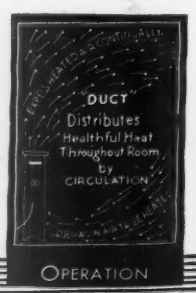
The practical applications of an effective, economical and portable Electric Radiator—which is simply plugged in and switched on—are many and varied. Almost any place that needs extra or timely warmth, independent of a central plant, suggests a DUCT installation.

Further information about our product may be promptly secured through reference to Sweets' Catalogue or by a request to us for literature.

DUCT ELECTRIC HEATER CORP.
101 Park Ave. New York, N. Y.



LEFT: Sketch reveals construction of patented DUCT chassis. When switch (D) is turned to "High" or "Low," copper plates (A) are heated by electric elements (B). The air in "ducts" (C) is heated and rises rapidly.

DUCT
THE
economical
ELECTRIC RADIATOR

RIGHT: Thorough and rapid heating causes strong circulatory effect. Heated air is uniformly distributed throughout the room without the aid of fans or blowers. Only Duct offers this patented principle and its significant results.